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American Veterinary Medical
Association

FORMERLY

AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Assn.)

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The American Veterinary Medical Association

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No. 1

MOTORIZED VS. HORSE-DRAWN FIRE APPARATUS

IN a consideration of the respective value and merit of motor equipment and horse-drawn equipment, one item which is worthy of attention is in connection with fire-fighting apparatus in winter. The City of Washington, D. C., has recently suffered from an unusually severe snow storm. For several days after the storm, the fire department has been comparatively ineffective in dealing with fires owing to the inability of the motorized apparatus to reach the scene of action. In at least one instance, according to newspaper reports, a house burned down after three different fire companies had failed to break through the snow drifts to the fire. Some equipment was pulled to the fire by commandeered horses, too late to be of use. In several instances the heavy fire engines were stalled on snowy hills about the city. About six years ago Detroit had a blizzard with a temperature of 13° below zero and a high wind. At that time the motorized equipment of the fire department was practically a complete failure. The motors were stalled in drifts all over the city and the horse-drawn apparatus saved the day, so far as fire control was concerned. Other cities have had similar experiences.

Such experiences show quite clearly the utter impropriety and inadvisability of complete motorization of fire departments in cities where in any years snow storms of any magnitude are experienced. Under suitable weather conditions motorized apparatus has a distinct advantage over horse-drawn apparatus. But under other conditions, motorized apparatus may be absolutely valueless and total motorization of a fire department may conceivably lead to the destruction of a city by fire. It may be that motorized apparatus capable of quickly reaching fires through snow drifts, in spite of high winds, low temperatures and high hills, may some day be developed, but such apparatus does not exist today. We are confronted by a condition, one which involves serious menace to life and property, and, as matters stand, all cities in the snow belt should retain an adequate reserve of horse-drawn fire equipment for emergency use. The cost of maintenance is a small matter compared with the potential loss from the lack of such equipment. This is a matter which deserves the attention and should command the support of veterinarians wherever occasional deep snows occur. The veterinarian should actively combat the complete motorization of the fire department in his vicinity under these conditions. We would further suggest that the Horse Association of America compile statistics in connection with losses due to motorization of fire departments and bring their findings to the attention of city authorities throughout this country.

M. C. H.

NUMBER AND VALUE OF FARM ANIMALS

A RECENT Government report gives the following estimates of livestock on farms and ranches of the United States.

The abnormal demand for all classes of farm animals which was caused directly or indirectly by the late war, resulted in a marked increase in the value of livestock as well as other farm products, which could not be expected to continue long after peace was declared. Since the close of the war, there has been a steady decrease in our production of farm animals. With the exception of swine and milk cows, we produced fewer animals in 1921 than in 1920. The most alarming feature of this report is the great decrease during the past three years, in the

value of farm animals. A reduction in the value of horses, cattle, sheep and swine affects the veterinary profession directly as farmers do not give as much attention to the health of their animals as they do when they are more valuable.

FARM ANIMALS.		NUMBERS.		VALUES.	
		PER CENT OF PRECEDING YEAR.	TOTAL NUMBER.	PER HEAD.	AGGREGATE.
Horses.....	Jan. 1, 1922	99.4	19,099,000	\$70.48	\$1,346,154,000
	Jan. 1, 1921	97.2	19,208,000	84.31	1,619,423,000
	Jan. 1, 1920	96.8	19,766,000	96.51	1,907,646,000
Mules.....	Jan. 1, 1922	99.7	5,436,000	88.26	479,806,000
	Jan. 1, 1921	100.5	5,455,000	116.69	636,568,000
	Jan. 1, 1920	101.8	5,427,000	148.42	805,495,000
Milk Cows.....	Jan. 1, 1922	101.8	24,028,000	50.97	1,224,767,000
	Jan. 1, 1921	99.5	23,594,000	64.22	1,515,249,000
	Jan. 1, 1920	100.6	23,722,000	85.86	2,036,750,000
Other Cattle.....	Jan. 1, 1922	98.4	41,324,000	23.78	982,666,000
	Jan. 1, 1921	96.8	41,993,000	31.36	1,316,727,000
	Jan. 1, 1920	99.3	43,398,000	43.21	1,875,043,000
Sheep.....	Jan. 1, 1922	96.3	36,048,000	4.80	173,159,000
	Jan. 1, 1921	96.0	37,452,000	6.30	235,855,000
	Jan. 1, 1920	96.4	39,025,000	10.47	408,586,000
Swine.....	Jan. 1, 1922	101.6	56,996,000	10.06	573,405,000
	Jan. 1, 1921	94.5	56,097,000	12.97	727,380,000
	Jan. 1, 1920	96.2	59,344,000	19.07	1,131,674,000

The number *not* on farms, i. e., in cities and villages, is not estimated yearly, but their number in 1920 as reported by the census was: Horses, 1,705,611; mules, 378,250; cattle, 2,111,928; sheep, 450,742; swine, 2,638,359.

Following changes in farm animals compared with January 1, 1920, are indicated: In total value, horses decreased \$561,492,000; mules decreased \$325,689,000; milk cows decreased \$811,983,000; other cattle decreased \$892,377,000; sheep decreased \$235,427,000; and swine decreased \$558,269,000 in the two years from January 1, 1920, to January 1, 1922.

The total value on January 1, 1922, of all animals enumerated above was \$4,779,957,000, as compared with \$8,165,194,000 on January 1, 1920, a decrease of \$3,385,237,000, or 41.5 per cent in the two years.

ANIMAL PETS AT THE WHITE HOUSE

AS yet the only animals to become identified with the new occupants of the White House are "Laddie Boy," the Airedale, and "Oh Boy," the English bull dog, presented to President Harding.¹ Both dogs are good Americans without aristocratic or exclusive notions. Although "Laddie Boy" is not what is termed a "one-man dog" and inclined to be friendly with anyone who holds out to him the olive branch, it is said that he is on especially intimate terms with the President, whom he

¹ Since the foregoing was written the President has been presented with "Harbel," a fine sorrel Thoroughbred gelding from Kentucky, and has resumed horseback riding after a lapse of nearly twenty years.

accompanies on walks and whose morning paper he carries to the table when breakfast begins.

The Wilson experience with livestock was more picturesque than fortunate. When the war came on, Mr. Wilson himself conceived the idea of utilizing the big back White House lawn as a grazing place for sheep. He therefore purchased 14 ewes and 4 lambs from a farm near Bel Air, Maryland. Contrary to many statements, these sheep were not purebred. They were grade Hampshires. Later one purebred Shropshire buck from New York and one from California were added, but the ewes in the woolly flock which so many visitors to Washington beheld grazing under the trees about the White House and which popular fancy described as the very *ne plus ultra* of sheep society with pedigrees reaching back to England or Spain, were in fact without ancestral distinction. Unfortunately the White House staff did not include a sheep husbandman, and much of the daily care of the flock fell into the hands of policemen and other like herdsman who did their best according to their lights. A veterinarian was detailed from the Bureau of Animal Industry who looked after lambing and did his best to rid the flock of parasitic diseases which early appeared. The transfer of the animals from the South lot to the North lot, where the shrubbery was surrounded with chicken wire, was a measure taken to provide the sheep with uninfested ground to graze upon. When Mr. Wilson's sickness came on in the late summer of 1920, the flock, which had increased to more than fifty, was disposed of to several persons.

When Mr. Taft was President it was determined suddenly one day to have a cow, and an official of the Bureau of Animal Industry was commissioned to make the purchase. Before one was found to suit, however, United States Senator Isaac Stephenson of Wisconsin presented Mr. Taft with Pauline Wayne, registered Holstein. This famous cow can not be said to have been entirely happy while she lived at the White House. She gave birth to a bull calf that was named "Big Bill," but he only survived several weeks. After a time, Pauline was sent to augment the purebred Holstein herd at the U. S. Soldiers' Home.

In Mr. Roosevelt's time at the White House, the horse was the animal in favor. The President was himself a famous rider and his favorite was the sorrel "Roswell." Mrs. Roosevelt was

an excellent horsewoman and often rode with her husband. Their daughter, Ethel, also rode with ease and grace. She had presented to her a fine Arabian mare, upon which she frequently accompanied her parents on their rides about the suburbs. Quentin Roosevelt had a pet dog, a black-and-tan, which he dearly loved, and he was heart-broken when the dog disappeared. His mother went with him to the municipal pound on a chance that the dog catcher had gathered in the pet, but, although they could not find him, they took back another small dog that within a few hours would have been chloroformed into dog heaven by the pound master.

Doubtless other Presidents had animal pets at the White House. For instance, it is recalled by old residents that little Tad Lincoln, as a boy of ten years or so, took great pleasure in a pair of goats that he had hitched to a sturdy wagon. Baby McKee in Harrison's time drove a single goat about the grounds and adjacent streets, often accompanied by the President. General Grant had a magnificent trotting horse, and he liked nothing better than to drive him to a light racing buggy, passing most vehicles on the road. Ulyses, Jr., and Jesse Grant drove to school a pair of Shetland ponies hitched to a little wagon. President Arthur and his son Chester A., Jr., were both fond of horses and had many of them. Mr. Arthur sometimes rode along sedately, but liked better to ride behind his four-in-hand bays, almost perfectly matched, and driven by his colored coachman.

A Texas paper advertises for sale "one heifer milk cow." Probably a case of precocious lactation.

After a consultation about a patient in Karlsruhe two medical men disagreed and one shot the other. In our country of course this would be a breach of medical etiquette.—*Punch* (London).

A traveler in Japan, according to *The Veterinary Record*, tells of an official municipal notice to motorists which reads as follows: "If a cow obstruct, toot 'er soothingly; if she continue to obstruct, toot 'er with vigor; if she still obstruct, wait till she pass away."

THE VETERINARIAN'S FUTURE ¹

By A. T. KINSLEY

President, American Veterinary Medical Association, Kansas City, Missouri

COMPARATIVELY SPEAKING, America is of relatively recent origin and the United States is but a child among nations. According to history, the progress of the various professions in any country has been in a direct ratio to the development of education in that country. A veterinarian is one skilled in veterinary science. Veterinary science "deals with the nature, prevention and treatment of animal diseases, the sanitary housing and care of livestock, and similar matters affecting the health of domestic animals and the healthfulness and wholesomeness of their products."

Probably the first record of a veterinarian or veterinary service occurs in the early history of the Roman Empire and refers particularly to the value of the proper care of the army horse by one familiar with the nature of the various plagues. The horse was recognized as an important factor in the conquests of the Old World, and the necessity of the proper care of these animals was fully appreciated by the warriors. The care of the army horse was originally under the supervision of farriers, who were succeeded in more recent times by the veterinarian.

Simultaneous with the evolution of the caretaker and farrier to the army veterinarian, there was in the agricultural communities a demand and necessity for someone to treat sick and afflicted animals, and thus originated the empiric practitioner. The increase in the numbers of livestock resulted in an increased demand for men skilled in the treatment of afflicted animals, and the most successful animal doctors became preceptors and thus demonstrated their methods to students. Knowledge was slowly accumulated and finally schools and colleges were established.

With the formation of nations, the necessity for the production of sufficient horses and of foods for both their horses and men was recognized as the determining factor in the success in future wars and the maintenance of their nations. The necessity for

¹ Presented at meeting of Minnesota State Veterinary Medical Association, St. Paul, January 13 and 14, 1922.

information of the cause, methods of dissemination and control of animal diseases was recognized by the rules and law-making bodies of progressive nations, and thus originated experiment stations and research laboratories. Information obtained in the various experiment stations and research laboratories clearly evidenced the necessity for the control and eradication of animal scourges, and thus originated the veterinary sanitarian.

The desire for information and the exchange of ideas was the prime object that stimulated the formation of veterinary associations, societies and other like bodies, and this is also the explanation of the origin of veterinary journals and periodicals.

Experiment stations and research laboratories demonstrated the value of some biologic agents in the diagnosis and control of certain diseases of animals. In some instances biologic products such as tuberculin and blackleg vaccine are produced in state and government laboratories. However, when the value of such products is established they are as a rule not produced in such laboratories, and the demand for these products was the reason private laboratories have been established.

Thus we have attempted to outline briefly the origin of the veterinarian, and in the discussion various phases of veterinary activity have been indicated. There would appear to be no argument for the necessity for each of the various so-called divisions or groups of the veterinary profession, and he who attempts to make odious comparisons evidences the magnitude of his power of reasoning in his failure of conception of the interdependence of the varied functions of veterinarians and their relationship to the profession as a whole. From the perspective of the livestock industry and the consuming public, each of the various phases of our profession is essential in making the production of livestock a more stable and therefore a more profitable business and in safeguarding the health of the people by efficient inspection of animal products.

The evolution of the veterinarian to the present standard has been the result of the properly directed effort and cooperation of the leaders of our profession, and has been as rapid as could reasonably be expected, and compares favorably with the development of any other profession.

The veterinarian's future will depend almost entirely upon the attitude and relationship that the profession as a whole as-

sumes with the agricultural interests and the conservation of the health of the human, for it is true that the inspection of meat food products and milk is an important function of the veterinarian and his services in this capacity are now fully appreciated by the consuming public.

Educational standard, that is, the requirement in veterinary colleges, is a very important topic in relation to the veterinarian's future. The attendance in veterinary colleges has diminished during the last three years, but this decrease has not been the result of the increased matriculation requirement. Other lures of endeavor have been more attractive, especially financially, than the veterinary profession, due to the low prices of livestock and a temporary oversupply of veterinarians. These conditions are only temporary and will soon be adjusted. The small number of students in veterinary colleges is one of the most favorable indications that veterinary activities are adjusting themselves.

Those engaged in the veterinary profession, whether as teacher, investigator, sanitarian, army officer, practitioner, or producer of commercial veterinary biologics, have an important function. There has been a small per cent of men who were apparently properly prepared who were not successful as veterinarians; but failures in other professions are equally common. Sufficient preparation and adaptability should be the basis for the selection of one's life work.

The reaction during the present reconstruction period has been severe on the veterinary profession, but the same or similar forces that produced the reaction will cause a readjustment, which is already appearing on the horizon, and the future outlook for the veterinarian is attractive. There are many opportunities for veterinarians as teachers, investigators, sanitarians, practitioners, etc.

There is an actual need at the present time of a larger number of efficient instructors in veterinary subjects. Teaching is one of the most important duties in our profession. The young men who have a sufficient education and adaptability should devote themselves to teaching, for the future of our profession will be largely determined by the efficiency of the veterinary college graduates. Other things being equal, the teacher who obtained his training from several different scientists in as many institu-

tions of learning has an advantage over the teacher whose education was completed in a single institution. However, the most successful teacher is not necessarily determined by the number of degrees he may have obtained or the number of foreign colleges and universities attended, but is dependent upon ability to impart correct information and cause his students to acquire knowledge. Teachers of such subjects as surgery, practice, therapeutics, pathology and sanitation are more proficient if a portion of their time is devoted to the application or practice of their specialty.

The opportunities for investigators on veterinary projects are becoming more numerous as a result of requests from the livestock producers who recognize the necessity for the reduction of losses in their flocks. Experiment stations exist in practically every State, and much valuable work has been done. The importance of the livestock industry to general agriculture and therefore to the welfare of our nation was never more fully appreciated than at the present time, and it would seem reasonable to anticipate an increased activity in the investigation of livestock problems. An efficient investigator is one who has the capacity of determining facts that are the deductions of carefully planned and technically executed experiments that have been accurately checked before announcing results. Research work requires a certain amount of routine that may be tedious. The investigator of livestock problems should familiarize himself with the usual conditions and surroundings on farms, and experimental findings should be checked under field conditions. There should be a close cooperation of investigators, sanitarians and practitioners, and the efficient teacher is always alert for proven facts from research laboratories.

The field for veterinary sanitarians is constantly increasing. The activity of the United States Department of Agriculture in the inspection of meat food products and the control of infections and contagious diseases of animals created a demand for veterinary sanitarians, and at the present time several hundred veterinarians are employed in this service. Various States also maintain departments of animal disease control manned by veterinary sanitarians. A large number of municipalities employ veterinarians in their food and dairy inspection departments. Transportation companies, through the Western Weighing and

Inspection Bureau's veterinary corps, are endeavoring to diminish the losses of livestock incidental to shipping. Livestock exchanges are recognizing the importance of disease control, especially of tuberculosis, and are employing veterinarians to assist State and Government officials in this important work.

There has been some criticism of the State and Government sanitary officials' control work because of the infringement upon the duties of the practitioner. In reviewing the governmental and commonwealth activities in animal disease control, it is found that the practitioner had little if any recognition in the eradication of the southern fever tick; but the nature of this problem, coupled with the fact that there were relatively few veterinarians in practice in the rural communities of the tick-infested area, would appear to justify the methods employed. A few years ago hog-cholera control measures were inaugurated by the Bureau of Animal Industry in cooperation with various States, and when successful plans of control had been proven, the practitioner assumed the responsibility. As a result of those cooperative demonstrations the practicing veterinarian has found an increased demand for his services. The more recent campaign of tuberculosis control will in my judgment be one of the most important factors in stabilizing veterinary practice. The annual tuberculin test of fully accredited herds is now being done by the practitioner. There are some accredited-herd owners who are objecting to employing a practitioner to conduct the annual tuberculin test, insisting that the Government and the State established the accredited herds and they should maintain them. Similar objections were made by swine owners when the practitioner was charged with the responsibility of the control of hog cholera, but the value of the local veterinarian is now appreciated by the swine producer and will likewise soon be recognized by the accredited-herd owner. Further, it does not seem probable that public opinion in this country will permit of the Government or State assuming the responsibility of private enterprises such as livestock production.

Technical knowledge, honesty and diplomacy are the prerequisites of a successful sanitarian. The duties of a sanitarian are important and interesting. However, there is frequently little variation, and a continuous routine may become burdensome. The sanitarian is the "go-between" of the livestock owner and

the practitioner, and he who is most successful in control measures cooperates fully with the local veterinarian. In fact, the practitioner is the most important link in the chain that has to do with the control of diseases of livestock.

Army service is attractive to some men. There will be a limited demand in the future for veterinarians for army service, and in times of war there may be extraordinary demands. The recent regulations for reserve officers should be carefully considered by the young men in the veterinary profession.

Commercial enterprises, such as the production of serum, bacterins and other biologics, offer opportunities to a limited number of veterinarians. The necessity for the commercial enterprises is fully appreciated at least by the practitioner and those engaged in the production of livestock. A few veterinarians are engaged in the production and distribution of general veterinary supplies, such as instruments, leather goods, etc. The ethical commercial veterinarian is doing a valuable service, and there are some inducements for competent men in this work.

The veterinary practitioner is the foundation upon which the veterinary profession has been built. According to the available records, about two-thirds of all veterinarians in active professional work are engaged in practice. The field of practice has many advantages over the other lines of veterinary activity. A practitioner conducts his own business and is usually an important citizen of his community. The remuneration of the practitioner is usually considerably more than that of his professional brother who is employed by the Government, State or municipality. The monotony of routine encountered by teachers, investigators and sanitarians is rarely experienced by the practitioner. It is true that the practitioner may be called day or night, but there are few night calls in a properly regulated practice. The practitioner has a definite and permanent home, a convenience not available to some veterinarians engaged in other lines.

Veterinary practice has undergone some radical changes in the last few years. The advent of the automobile substantially diminished equine practice, particularly in cities, and it, combined with better roads, also increased the territory of the practitioner, particularly in the rural districts. The increasing knowledge of feeds and feeding by horse owners and operators

has noticeably decreased the number of cases of indigestion, colic and allied difficulties. For some reason there has apparently been a decrease in the number of cases of operative surgery and dentistry.

The diminished demands in equine practice and surgery have been more than equalized by the increased demands of the practitioner in the prevention and relief of diseases in the meat-producing animals. The practitioner of the future has an almost unlimited field if he will apply himself. Much more valuable service can be rendered in general surgery and equine dentistry than has been done recently. Such cases may have been neglected by the practitioner because more remuneration could be obtained by vaccination of swine and other similar work. The poultry industry is demanding assistance in the prevention of losses in the flocks, and this is an opportunity for the veterinarian to increase his usefulness and to establish more firmly the necessity for a complete veterinary service in every community. If practitioners will assume the responsibility they can be experts in their communities on feeds and feeding problems and on questions of breeding. Unless veterinarians prepare for and assume the responsibility on such problems as feeding, breeding and control of poultry diseases, others less capable will assume this role. There may be a possibility of the development of specialists in the various subjects of the practicing veterinarian's domain, but the livestock industry can not now, and it is problematic whether it ever will, support a specialist to care for each of the various problems that may arise in each community.

The general practitioner who will be an asset to his community should be properly equipped to render an efficient service. That is, he should be capable, adaptable, ethical, respectable, conscientious, and should have sufficient endurance to enable him to withstand the hardships of a general practice. There has been a tendency toward commercialism by a few unethical practitioners. The commercializing of a profession diminishes the standing of that profession, and it is incumbent upon us to conduct our business in an ethical manner and avoid public censure.

A veterinarian either progresses or he retrogresses. Veterinarians progress by comprehensive reading and by association with other veterinarians. Veterinarians who do not read pro-

fessional journals and attend association meetings are retrogressing and are a discredit to the profession. Every veterinarian in a given State should be an active member of the State veterinary association and the American Veterinary Medical Association.

The influence of the American Veterinary Medical Association upon the future of our profession will depend upon the loyalty of veterinarians to that organization. The past accomplishments, educational and legislative, due to the influence of the American Veterinary Medical Association, are well known. The greater the percentage of eligible veterinarians who are members of the American Veterinary Medical Association, the more representative of our profession that organization becomes. Unity signifies strength. Can a veterinarian do more as a member helping to shape the destiny of the American Veterinary Medical Association and our profession, or as a fault-finding, censuring, condemning outsider? If you are loyal to the profession you should be loyal to your State association and the American Veterinary Medical Association, the organizations that have given our profession its recognition and standing.

The various activities of veterinarians have been briefly discussed. There are about 12,000 veterinarians in the United States engaged in actual professional work. The average professional man continues in active service from 20 to 25 years, and if this is applicable to veterinarians there would be between 400 and 600 retiring from the profession each year. There is now a temporary surplus of veterinarians, but on the other hand there are less than 200 veterinarians graduated from all of the veterinary colleges each year. If the present demand continues—and there are no indications that it will not—the surplus of veterinarians will soon be exhausted and there will be an increased attendance at veterinary colleges.

In conclusion, it is evident, first, that the veterinary profession will survive, because veterinary service alone insures the live-stock industry against the ravages of disease and is an indispensable adjunct in the conservation of the health of the nation; second, that the veterinarian's future in the United States with its six and a half billion dollars' worth of farm animals, the constantly increasing demands for efficient milk and meat inspection, the necessity for State and Government control of in-

fectious diseases, the army service and the opportunities in college and research work, should cause little concern provided the various veterinary activities are properly correlated and the services rendered are for the interests of the livestock producer and the consuming public.

COUNTY AGENTS

In scanning the corn belt farm papers these times it is apparent that many county agents are losing their jobs, for in many counties petitions are being circulated asking county courts or commissioners not to re-employ them and in most cases the petitions are based on the plea that in these strenuous financial times the county agent is an unnecessary luxury, while in others the statement is frankly made that these men are not making good. In our opinion, each agent should be judged upon his merits. We have never been able to understand, for instance, why a county agent should not put in the whole winter making schoolhouse addresses on soil fertility, feeding balanced rations, leguminous crops and other vital agricultural subjects—and if he isn't capable of doing this, then he isn't able to earn his salary. From now on farmers are going to vigorously oppose the carrying of "excess baggage." They are going to demand that those who live on the farmers' taxes in whole or in part shall earn their money or get off the payroll—and hence the days of the county agent who is merely trying to "get by" are numbered.—*The Missouri Farmer*.

Prof. John R. McCall, of the Glasgow Veterinary College, in an address before a Glasgow club reviewed the part played by the horse in the great war. At the outbreak of the war, he said, the British army possessed 25,000 horses. In the first 12 days 165,000 horses were impressed into the army service in Great Britain alone. In 1918, there were more than a million horses and mules in the British army. He said that North America furnished the largest contribution to the horse strength of the British army, and that the best type of horse under the severe conditions of warfare in France was the Percheron cross, thousands of which were brought from North America.

ABORTION DISEASE MANIFESTATIONS IN A DAIRY HERD WITHOUT DEMONSTRABLE CAUSE

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FROM WORK already carried out, the writers of this report are strongly of the opinion that the vast majority of cases of abortion disease in California are associated with infection by *Bacillus abortus* Bang. In a small herd under our supervision several abortions and other evidences of abortion disease have occurred and our efforts to detect the presence of infection with *B. abortus* Bang or other specific organism have failed.

The Division of Veterinary Science has maintained on the Berkeley campus for a number of years a small certified dairy. The herd has consisted of from 24 to 26 cows in the milking barn, 5 to 8 dry cows, and 1 bull. In addition, 6 to 8 heifers are raised each year, making a total varying between 45 and 60 head of animals on the premises. The present bull is a purebred Ayrshire, and was added to the herd in August, 1917. He was raised by the breeder from whom we purchased him, was not one year old until September 6, 1917, and probably never was in service until he came to this dairy.

While an effort has been made to keep the dairy supplied with milk cows by raising heifers, it has from time to time been necessary to purchase cows in order to keep the milk supply at the desired level. In 1917, for example, prior to the purchase of the present bull, the previous animal had failed to get the cows properly bred. A number were therefore sold to the butcher and ten outside animals purchased. The trouble at this time was probably due to lack of exercise on the part of the bull. He would not serve cows in oestrus that were turned in with him. On being shipped to the University Farm at Davis, where proper exercise could be given him, he again became a satisfactory breeder. In 1918 no additions were made. In 1919 one first calf heifer was added. In 1920 four animals were purchased. In 1921 to October no additions were made. In all there were 15 cows and one bull added during the period covered by this report, 11 of which animals are still in the

herd. None of the five cows which were sold for slaughter were disposed of on account of breeding difficulties. Two of them reacted to the tuberculin test, two had mammitis, and one was too low in milk production to keep in the dairy.

In the purchase of cows for this dairy care is used to prevent the introduction of tuberculosis, and therefore the animals are usually purchased from small herds close by or from herds the history of which we know something about. Even with these precautions we were not entirely successful in keeping out tuberculosis, as attested by two of the animals later reacting to the tuberculin test. This is the reason for keeping the herd supplied with young stock raised on the premises.

During the years 1917, 1918 and 1919 breeding difficulties of more or less magnitude were encountered, such as an occasional abortion, retained afterbirth, cystic ovaries and delayed œstral periods requiring expression of the corpus luteum. Agglutination tests with *Bacillus abortus* as an antigen made from time to time on individual animals resulted negatively. Fleischner and Meyer in 1916 made examinations of the certified milk sold in the Bay Cities for the presence of tubercle bacilli. This resulted negatively, but they did find *Bacillus abortus* a more or less commonly present organism. From the University Certified Dairy it was found in two of three lots of milk collected January 8, 18, and 22, 1917, respectively. Four guinea-pigs were inoculated with each lot of milk. Two of the four inoculated with the first lot and one of the four inoculated with the second lot showed *Bacillus abortus* infection. The remaining nine experimental animals were negative.

All the cows of milking age in January, 1917, except Nos. 1864 and 1869 in Table 1, had been disposed of by August, 1920, and it was decided at this time to make a systematic search for the presence of this organism in the dairy animals.

On August 25, 1920, blood was drawn from the 24 cows in milk, and on August 30 from the remaining 24 head of dry cows, young stock and bull, making a total of 48 head in the dairy at that time. These samples were tested in four dilutions against three strains of *Bacillus abortus* antigen. The results of this test are given in Table 1. It will be observed that all of the samples gave a totally negative reaction to this test, except the blood from No. 2057. The serum of this animal gave a ++

reaction in 0.04 c.c. and a —+ reaction in 0.02 c.c. against all three antigens.

TABLE 1.—AGGLUTINATION TESTS OF BLOOD SAMPLES FROM ALL THE ANIMALS IN THE DAIRY HERD, AUGUST, 1920.

EAR TAG NO.	ANTIGEN 1 PORCINE				ANTIGEN 80 BOVINE				ANTIGEN 104 BOVINE			
	0.04	0.02	0.01	0.005	0.04	0.02	0.01	0.005	0.04	0.02	0.01	0.005
1964	—	—	—	—	—	—	—	—	—	—	—	—
1966	—	—	—	—	—	—	—	—	—	—	—	—
1958	—	—	—	—	—	—	—	—	—	—	—	—
2030	—	—	—	—	—	—	—	—	—	—	—	—
1235	—	—	—	—	—	—	—	—	—	—	—	—
1965	—	—	—	—	—	—	—	—	—	—	—	—
1223	—+	—	—	—	—+	—	—	—	—+	—	—	—
2177	—	—	—	—	—	—	—	—	—	—	—	—
1662	—	—	—	—	—	—	—	—	—	—	—	—
1441	—+	—	—	—	—+	—	—	—	—+	—	—	—
2062	—	—	—	—	—	—	—	—	—	—	—	—
1953	—	—	—	—	—	—	—	—	—	—	—	—
2026	—	—	—	—	—	—	—	—	—	—	—	—
2061	—+	—	—	—	—+	—	—	—	—	—	—	—
1967	—	—	—	—	—	—	—	—	—	—	—	—
2029	—	—	—	—	—	—	—	—	—	—	—	—
1801	—	—	—	—	—	—	—	—	—	—	—	—
2055	—	—	—	—	—	—	—	—	—	—	—	—
1442	—	—	—	—	—	—	—	—	—	—	—	—
2175	—+	—	—	—	—+	—	—	—	—	—	—	—
1960	—	—	—	—	—	—	—	—	—	—	—	—
1957	—+	—	—	—	—+	—	—	—	—+	—	—	—
1864	—	—	—	—	—	—	—	—	—	—	—	—
1663	—	—	—	—	—	—	—	—	—	—	—	—
2155	—	—	—	—	—	—	—	—	—	—	—	—
2171	—	—	—	—	—	—	—	—	—	—	—	—
1968	—	—	—	—	—	—	—	—	—	—	—	—
1869	—	—	—	—	—	—	—	—	—	—	—	—
2170	—	—	—	—	—	—	—	—	—	—	—	—
2057	++	—+	—	—	++	—+	—	—	++	—+	—	—
1438	—	—	—	—	—	—	—	—	—	—	—	—
1445	—	—	—	—	—	—	—	—	—	—	—	—
2143	—	—	—	—	—	—	—	—	—	—	—	—
2142	—	—	—	—	—	—	—	—	—	—	—	—
2027	—	—	—	—	—	—	—	—	—	—	—	—
2181	—	—	—	—	—	—	—	—	—	—	—	—
1969 (Bull)	—	—	—	—	—	—	—	—	—	—	—	—
2178	—	—	—	—	—	—	—	—	—	—	—	—
2179	—	—	—	—	—	—	—	—	—	—	—	—
2180	—	—	—	—	—	—	—	—	—	—	—	—
1435	—+	—	—	—	—+	—	—	—	—+	—	—	—
2060	—+	—	—	—	—+	—	—	—	—+	—	—	—
2063	—	—	—	—	—	—	—	—	—	—	—	—
2144	—	—	—	—	—	—	—	—	—	—	—	—
2173	—+	—	—	—	—+	—	—	—	—+	—	—	—
2154	—	—	—	—	—	—	—	—	—	—	—	—
2183	—	—	—	—	—	—	—	—	—	—	—	—
2182	—	—	—	—	—	—	—	—	—	—	—	—

Explanation of symbols in table:

- Indicates no evidence of reaction.
- + Indicates slight sedimentation but supernatant fluid turbid.
- +— Indicates more sedimentation than —+ but still a faint cloudiness in supernatant fluid.
- ++ Indicates that after overnight incubation complete agglutination is present.
- + Indicates that after overnight incubation there was not complete agglutination, but on standing for 24 hours longer the tube cleared up.

Animal No. 2057 was a heifer, never having had a calf. She was born in the dairy in November, 1917, but not sired by the dairy bull. Her dam was cow No. 2029, purchased when middle aged, just prior to the birth of this calf in November, 1917.

The dam is still in the dairy and has had the following breeding record since purchase:

Gave birth to calf 2057 shortly after arriving at the dairy, November, 1917.

Bred March 20, 1918, and calved normally December 28, 1918.

Bred March 20, April 24 and May 25, 1919. Pregnant to last service and calved normally March 15, 1920.

Bred April 20 and May 10, 1920. Pregnant to last service and calved normally February 21, 1921.

Bred June 2, 1921. Pregnant to this service and at present in milking barn.

Heifer No. 2057 later aborted and will be discussed as Case 2.

CASE 1

Heifer 2154 was the first animal to abort after the general examination of the blood of all the animals given in Table 1. She was born February 15, 1919, and her dam was Cow 1438, which animal has aborted twice and will be discussed as Case 5. At the time blood was drawn this animal was not thought to be pregnant, as she had never been bred by the herd bull. During the spring of 1920, however, there was a history of a stray bull having gotten into the pasture for a few days where this heifer and some other animals were being kept.

On the morning of September 16, 1920, a rider for the water company, whose watershed adjoins our range, saw a heifer in the pasture that had given birth to a premature dead calf, but did not report this until evening. The fetus was seen and covered up with loose dirt by the rider. The forenoon of this same day the dairy foreman noticed Heifer 2154 at the watering trough with tail held out and vulva congested, but did not suspect abortion on account of having no breeding record on the animal. The following day, the water company employee not being available, a search was made of the pasture, but no fetus was found. Coyotes and other predatory animals have been trapped and seen in this pasture and their presence may explain the failure to find the fetus. The animals in the pasture were brought to the barn and upon examination all that were known to be pregnant were still so. On examining No. 2154, although only about 19 months old, the hand could be readily passed into the vagina. The vaginal walls showed some congested areas but the cervix was closed so that one finger could not be inserted into the cervical canal.

The vagina was douched with physiological salt solution, after

which the uterus was examined per rectum and found to be enlarged. By massaging it through the rectum with the other hand in the vagina cupped over the cervix, a small amount of mucus containing flakes of yellowish pus-like material was obtained.

This was placed in a sterile bottle and taken to the laboratory. Two guinea-pigs, Nos. 1731 and 1732, were inoculated intra-abdominally September 18, 1920, with the uterine discharge from this heifer. These experimental animals were chloroformed February 7, 1921, and found to be in a normal condition.

This heifer was bred again December 17, 1920, February 22, 1921, and March 28, 1921, and is now pregnant to the last service.

Agglutination tests made on her blood drawn April 20 and August 20, 1921, resulted negatively.

CASE 2

At the time the blood samples in Table 1 were taken Heifer 2057 was pregnant to a service July 22, 1920. She had previously been bred on at least two occasions, June 10, 1919, and August 10, 1919. From the later date to July 22, 1920, she had been on a hill pasture not exposed to a bull.

On March 27, 1921, while in the pasture, this animal aborted a male fetus due in May from the July service noted above, and the placenta was retained. The animal was brought to the barn and isolated. On March 29, 1921, the membranes were removed manually with little difficulty, the uterus was douched and several ounces of petroleum oil placed in it, following which no further treatment was found necessary.

The fetus was found on the pasture at 4 p. m., March 27, with a few blow-fly larvæ deposited about the nostrils, and was brought to the laboratory at 6:15 p. m. On autopsy it showed sero-sanguineous fluid infiltration of the subcutis especially in the axillary and inguinal regions. The thoracic and abdominal cavities were filled with blood-stained fluid. Some gelatinous masses were present around the heart. The spleen measured 20 by 5 by 2 centimeters and showed several sub-capsular hemorrhagic blotches. The stomach contents were a stringy turbid mass intermixed with gray flakes and blood. The intestines were apparently normal.

Cultures were inoculated the same evening from the tissues and fluids as follows:

Stomach

1. Shake 2 per cent glycerin, 1 per cent glucose-agar bouillon. Discarded May 17, 1921. No growth.
2. Shake 2 per cent glycerin, 1 per cent glucose-agar bouillon plus serum. No change until April 12, 1921, when a cloudiness was observed on the surface. Subculture and microscopic examination failed to reveal any organism; probably a precipitation of the serum.
3. Cooked blood agar slant. Discarded May 17, 1921. No growth.
4. Cooked blood agar slant. Discarded May 17, 1921. No growth.
5. Cooked blood agar slant in CO₂ chamber.¹ Discarded May 17, 1921. No growth.
6. Cooked blood agar slant in CO₂ chamber. Discarded May 17, 1921. No growth.
7. Cooked blood agar plate in CO₂. Seven colonies; 5 varieties developed. April 2, 1921. All discarded April 12, 1921.
8. Cooked blood agar plate in CO₂ chamber. Many contaminations. May 4, 1921. Discarded April 12, 1921.

Liver

1. Shake 2 per cent glycerin, 1 per cent glucose-agar bouillon. Discarded May 12, 1921. No growth.
2. Shake 2 per cent glycerin, 1 per cent glucose-agar bouillon plus serum. Cloudiness developed as in same culture from the stomach. Subcultured as above. No growth.
3. Cooked blood agar. Discarded May 17, 1921. No growth.
4. Cooked blood agar slant in CO₂ chamber. Discarded May 17, 1921. No growth.
5. Cooked blood agar plate in CO₂ chamber. Overgrown with contaminating colonies and discarded, April 12, 1921.

Spleen

1. Shake 2 per cent glycerin, 1 per cent glucose-agar bouillon. Discarded May 17, 1921. No growth.
2. Shake 2 per cent glycerin, 1 per cent glucose-agar bouillon plus serum. Discarded May 17, 1921. No growth.
3. Cooked blood agar slant. Discarded May 17, 1921. No growth.
4. Cooked blood agar slant in CO₂ chamber. Discarded May 17, 1921. No growth.

Intestines (Colon)

1. Shake 2 per cent glycerin, 1 per cent glucose-agar bouillon. Discarded May 17, 1921. No growth.
2. Shake 2 per cent glycerin, 1 per cent glucose-agar bouillon. Discarded May 17, 1921. No growth.
3. Cooked blood agar, CO₂ chamber. Discarded May 17, 1921. No growth.
4. Two per cent glycerin, 1 per cent glucose-agar slant. Discarded May 17, 1921. No growth.
- 5 and 6. Two per cent glycerin, 1 per cent glucose-agar slant and liver agar in CO₂ chamber. Discarded May 17, 1921. No growth.

All of the above-mentioned cultures except those placed in the CO₂ chamber were sealed with sealing wax as suggested by Theobald Smith. Smears were made from the stomach,

¹ Huddleson. Cornell Veterinarian. 1921, vol. 11, pp. 210-215.

liver, spleen and intestinal contents and examined in stained and unstained preparations, but no vibrios or other definite microorganisms could be seen.

Five guinea-pigs (three male and two female) were inoculated March 29, 1921, with the tissues of this abort, and one male guinea-pig with colostrum from the udder of the dam, as follows:

Guinea-pig 1778 intraabdominally with intestinal content.
Guinea-pig 1779 intraabdominally with intestinal content.
Guinea-pig 1780 intraabdominally with stomach content.
Guinea-pig 1781 intraabdominally with stomach content.
Guinea-pig 1782 intraabdominally with liver and spleen emulsion.
Guinea-pig 1783 intraabdominally with colostrum from dam.

These animals were bled April 11, 1921, and the blood gave a negative agglutination test to *Bacillus abortus* of both bovine and porcine origin. Guinea-pig 1780 was in a moribund condition April 19, 1921, and was bled and killed. The blood gave a negative agglutination test. Postmortem showed many small grayish specks on liver. Lungs contained several small solidified areas. Cultures from liver, spleen and lungs, kept under observation until July 18, 1921, showed no growth excepting that one shake culture developed a surface growth of a Gram-positive coccus.

The blood of all guinea-pigs used in this work except Nos. 1731 and 1732 in Case 1 and Nos. 1829 and 1830 in Case 4 was tested for the presence of *Bacillus abortus* agglutinins before inoculation and found negative. This bleeding was done from the ear vein,¹ one-half mil of blood being collected in 4½ mils of carbolized sodium citrate saline solution.

The remaining five guinea-pigs were bled and killed July 11, 1921. Their blood gave a negative agglutination test.

Postmortem notes on these animals were as follows:

No. 1778, no lesions found.
No. 1779, no lesions found.
No. 1781, no lesions found.
No. 1782, no lesions found.
No 1783, no lesions found; carcass emaciated.

April 27, 1921, the genital tract of this cow was examined and found to be normal. Agglutination tests, as shown in Table 2, were made on blood drawn from this animal, in addition to those given in Table 1.

¹ Seddon. Jour. Comp. Path. and Ther., 1915, vol. 28, p. 25.

TABLE 2.—ABORTION AGGLUTINATION TESTS, COW 2057.

ANTIGEN	MAR. 27, 1921	APR. 18, 1921	APR. 28, 1921	MAY 23, 1921
No. 1 (Porcine)				
0.04.....	++	++	+-	+-
0.02.....	++	+-	-	-
0.01.....	-	-	-	-
0.005.....	-	-	-	-
B-104 (Bovine)				
0.04.....	++			
0.02.....	++			
0.01.....	-			
0.005.....	-			
No. 3 (Porcine)				
0.04.....	+			
0.02.....	-			
0.01.....	-			
0.005.....	-			
No. 2 (Porcine)				
0.04.....	++	++		
0.02.....	+-	+-		
0.01.....	-	-		
0.005.....	-	-		
B. A. (Bovine)				
0.04.....	++	++		
0.02.....	+-	+-		
0.01.....	-	-		
0.005.....	-	-		
No. 4 (Bovine)				
0.04.....	++			
0.02.....	++			
0.01.....	-			
0.005.....	-			
No. 80 (Bovine)				
0.04.....				+
0.02.....				-
0.01.....				-
0.005.....				-

A sample of milk was taken from her May 6, 1921, and inoculated into guinea-pigs. This sample consisted of first milk and strippings in approximately equal amounts, total about one quart of the evening milking. Six hundred mls of this were centrifuged and the sediment inoculated intra-abdominally into Guinea-pigs 1795 and 1796 on May 8, 1921. These guinea-pigs were bled July 14, 1921, and again at the time of slaughter, August 30, 1921, and the blood gave a negative agglutination test to *Bacillus abortus* of both porcine and bovine origin. Post-mortem examination was negative except for some adhesions from peritonitis in Guinea-pig 1795. Cultures made from the spleens of the animals on blood-agar remained sterile.

This cow was sold to the butcher and slaughtered on May 26, 1921, on account of the fact that she was the only animal in the herd giving any semblance of what might be termed an agglutination reaction to *Bacillus abortus* antigen. Milk was

again taken from her just prior to slaughter and inoculated into Guinea-pigs 1817 and 1818 in the same manner as the sample taken May 6, 1921, with negative results.

Two guinea-pigs, Nos. 1819 and 1920, were inoculated intra-abdominally May 28, 1921, with scrapings from her uterine mucous membrane and supramammary lymph glands. These guinea-pigs were bled June 25, 1921, and again on July 14, 1921, and the blood was tested against *Bacillus abortus* antigens of bovine and porcine origin, with negative results. They were bled and killed August 30, 1921. Postmortem examinations showed them to be normal. Agglutination tests made on their blood were negative. Cultures made on blood-agar from their spleens remained sterile.

CASE No. 3

Cow 2301 was raised at the dairy and had calved normally April 18, 1918, June 15, 1919, and April 30, 1920.

Following the last parturition she was bred June 28, 1920, and became pregnant to the service. She was, therefore, 2 months pregnant when the blood samples in Table 1 were taken. On March 30, 1921, this cow delivered dead twins conceived 275 days previously on June 28, 1920. This pregnancy, therefore, terminated a few days prematurely, which may be accounted for by the fact that there were twins.

The fetuses were male and female and the tissues and organs in both were apparently normal. The membranes of each fetus appeared normal, only one small necrotic area being observed in one fetal cotyledon.

The fetuses were taken to the laboratory for further examination. From the stomach and lungs respectively of each fetus the following cultures were made:

Cooked blood-agar	} Sealed and incubated
2 per cent glycerin, 1 per cent glucose shake agar	
Gentian violet fetus medium	
Cooked blood-agar	} Placed in 10 per cent CO ₂ chamber and incubated
2 per cent glycerin, 1 per cent glucose agar slant	
Gentian violet fetus medium	
Cooked blood-agar plate	

Smears were made from the stomach and lungs of both the fetuses and examined in stained and unstained preparation. No definite organisms could be found in them.

All the cultures from the male fetus remained sterile, as well as those from the stomach of the female fetus. The cooked blood-agar plate and the fetus medium from the lung of the female fetus under CO₂ showed a few colonies of contaminating organisms (*Bacillus subtilis*) of no significance. All the cultures were discarded May 17, 1921.

On March 31, 1921, guinea-pigs were inoculated intra-abdominally with tissues of the fetuses as follows:

Guinea-pig 1784. Placenta of both fetuses, including a portion of the necrotic area mentioned above.

Guinea-pig 1785. Stomach contents of both fetuses.

Guinea-pig 1786. Lungs of both fetuses.

Guinea-pigs 1784 and 1786 were bled and killed July 2, 1921. Postmortem examination of No. 1784 showed an abscess on the greater curvature of the stomach from which a streptococcus was isolated. Guinea-pig 1785 was bled and killed July 13, 1921. Postmortems of this animal and of No. 1786 were negative. Agglutination tests made on the blood of all three animals were negative.

EXAMINATIONS OF MILK SAMPLES FROM THE HERD

On May 25, 1921, milk samples were taken from all the cows in the dairy giving milk at the time and composite samples were injected into guinea-pigs. The samples were collected as shown below, and two guinea-pigs were inoculated with each sample, making a total of twenty experimental animals.

MILK SAMPLES FROM U. C. DAIRY ANIMALS

(Taken from evening milking May 25, 1921. At least 600 c.c. samples centrifuged May 26 and sediment inoculated intra-abdominally into guinea-pigs May 27, 1921.)

Sample 1. Composite of first milk and strippings in approximately equal amounts total about one quart from Cows 2027, 2178, 2299, 1869 and 1662, inoculated into Guinea-pigs 1797 and 1798.

Sample 2. Ditto from Cows 1968, 2055, 2063, 1960 and 1967, inoculated into Guinea-pigs 1799 and 1800.

Sample 3. Ditto from Cows 2029, 2301, 1864, 1435 and 1965, inoculated into Guinea-pigs 1801 and 1802.

Sample 4. Ditto from Cows 1438, 2298, 2300, 2030 and 2026, inoculated into Guinea-pigs 1803 and 1804.

Sample 5. Ditto from Cows 1223, 2060, 2296, 2177 and 2061, inoculated into Guinea-pigs 1807 and 1808.

Sample A. From vat after milking of Cows 2027, 2178, 2299, 1869, 1662, 1868 and 2063, inoculated intra-abdominally Guinea-pigs 1809 and 1810.

Sample B. From vat after milking Cows 2055, 1967, 2029, 2301, 1864, 1960 and 1435, inoculated intra-abdominally Guinea-pigs 1811 and 1812.

Sample C. From vat after milking of Cows 1438, 1965, 2298, 2300,

2030, 2026 and 1223, inoculated intra-abdominally Guinea-pigs 1813 and 1814.

Sample D. From vat after milking of Cows 2296, 2060, 2177, 2061, 2142, 1957 and 1953, inoculated intra-abdominally Guinea-pigs 1815 and 1816.

Six of these Guinea-pigs, Nos. 1799, 1801, 1802, 1805, 1810 and 1816, died of intercurrent disease. Blood was obtained from No. 1805 June 16, from No. 1802 June 23, and from No. 1801 June 25, all of which gave negative agglutination tests. The remaining 14 were bled June 25, July 14, and before slaughter August 27 and 30, respectively. Agglutination tests made on these blood samples against *Bacillus abortus* antigens of bovine and porcine origin all resulted negatively.

Postmortem notes on these animals were as follows:

POSTMORTEM NOTES ON INOCULATED GUINEA-PIGS

Guinea-pig 1797. cooked blood-agar.	Condition good; no lesions. Cultured spleen on
Guinea-pig 1798. cooked blood-agar.	Condition good; no lesions. Cultured spleen on
Guinea-pig 1800. cooked blood-agar.	Condition good; no lesions. Cultured spleen on
Guinea-pig 1803. cooked blood-agar.	Condition good; no lesions. Cultured spleen on
Guinea-pig 1804. cooked blood-agar.	Condition good; no lesions. Cultured spleen on
Guinea-pig 1806. cooked blood-agar.	Condition good; no lesions. Cultured spleen on
Guinea-pig 1807. cooked blood-agar.	Condition good; no lesions. Cultured spleen on
Guinea-pig 1808. cooked blood-agar.	Condition good; no lesions. Cultured spleen on
Guinea-pig 1809. cooked blood-agar.	Condition good; no lesions. Cultured spleen on
Guinea-pig 1811. lung and pleura.	Condition good; slight adhesions between left Cultured spleen on cooked blood-agar.
Guinea-pig 1812. cooked blood-agar.	Condition good; no lesions. Cultured spleen on
Guinea-pig 1813. an abscess.	Condition good; left lung showed adhesions and Cultured spleen and lung on cooked blood-agar.
Guinea-pig 1814. cooked blood-agar.	Condition good; no lesions. Cultured spleen on
Guinea-pig 1815. cooked blood-agar.	Condition good; no lesions. Cultured spleen on

All of the cultures made from the spleens and incubated under 10 per cent CO₂ pressure remained sterile and were discarded September 23, 1921. The culture made from the abscess in the lung of Guinea-pig 1813 showed a growth after two days of a bipolar organism not considered significant.

CASE 4

Cow 1662 was raised at the dairy. First calf born normally August 16, 1918. Second calf born normally September 23, 1919. Third calf born July 13, 1920. At this parturition the afterbirth was retained and had to be treated and manually removed. The uterus was examined and found to be apparently normal August 28, 1920. This cow was bred October 20 and November 10, 1920, and March 1, 1921, becoming pregnant to the last service. Her blood was examined as shown in Table 1 and again April 26, 1921, and gave negative agglutination tests. The animal was examined and found pregnant July 9. In this examination one hand was placed in the rectum and the other in the vagina. The hand in the vagina clasped the cervix, fixed it and exerted some traction posteriorly.

On the morning of July 29, five months after conception and twenty days following examination, this cow, when brought into the barn, had fetal membranes protruding from the vagina, but a search of the corral failed to reveal the expelled fetus, probably for the same reason as that mentioned in Case 1. At 4 p. m. this day the cow was examined and the fetal membranes removed. The fetal cotyledons were quite yellow in appearance. The chorion had a light pink color, but on close examination this color was streaked with yellow. In three areas about four inches in diameter the capillary congestion was very marked, being unevenly distributed so that the membrane appeared mottled with reddish spots about the size of a pea. The membranes appeared perfectly fresh with no odor or evidence of decomposition.

Two guinea-pigs, Nos. 1829 and 1830, were inoculated with 1 c.c. each of an emulsion obtained by grinding small pieces of tissue from the cotyledons and membranes with the gelatinous material in the membranes and a small amount of sterile physiological salt solution.

Blood was taken from these guinea-pigs by bleeding from the ear August 20, 1921, and the agglutination test with *Bacillus abortus* antigens of bovine and porcine origin was applied to it, with negative results.

The guinea-pigs were bled again and killed November 10, 1921. Both were normal on postmortem examination, although

No. 1830 was in poor condition. Agglutination tests made on the blood were negative. Cultures were made on blood-agar plates from the spleen of 1829 and from the spleen and testicle of 1830 and incubated under 10 per cent CO_2 pressure in a glass jar.

The blood-agar plates were examined at the end of four days' incubation in the CO_2 chamber and showed only a few contaminating colonies. The plate from the testicle of No. 1830 showed only one colony and it was not on the streaked area. These plates were kept in the incubator not under CO_2 for three days longer and were discarded November 22, 1921, having shown no significant organisms.

CASE 5

Cow 1438, the dam of No. 2154, Case 1, was born in the dairy in 1914. Her first calf was born normally in January or February, 1917. Second calf born normally January 28, 1918. Third calf born normally February 15, 1919.

Following this parturition she was bred again in May or June, 1919, the exact date not being recorded.

December 17, 1919, she aborted twins at about 7 months' gestation, and the afterbirths were retained, requiring treatment and manual removal.

She was bred again on February 14, 1920, and became pregnant to this service. The agglutination test shown in Table 1 on her blood was negative. She calved normally November 10, 1920. This is an unusually good milk cow and she was not bred again until April 4, 1921, to which service she conceived.

A second agglutination test was made on blood taken from the animal April 26, 1921, with negative results. This animal was examined for pregnancy by the bimanual method, as in Case 4, September 15, 1921, and found to be pregnant.

During the night of Sunday, September 25, she aborted the fetus conceived April 4 and had retained afterbirth which had to be treated and manually removed September 28, 1921.

The fetus was brought to the laboratory on the morning of September 26, 1921, and cultures were made from the stomach, lung and thoracic fluid as follows:

- Three glycerin-agar shake cultures.
- Three glycerin-agar slant cultures.
- Two cooked blood-agar slant cultures.
- Three glycerin-agar plate cultures.
- One blood-agar plate.

All the cultures were incubated under 10 per cent CO₂ pressure. Smears and hanging drop preparations made from the fresh material did not show any definite organisms. The cultures remained sterile with the exception of two large white colonies on one plate culture and one on another, which were clearly of no significance. The cultures were discarded October 12, 1921, by which time molds had developed on the plates, but nothing in the tubes.

Two guinea-pigs, Nos. 1843 and 1844, were inoculated with stomach contents, thoracic fluid and lung of the fetus September 21, 1921. Blood taken from these guinea-pigs November 16, 1921, gave a negative agglutination reaction with *Bacillus abortus*. They were bled and killed December 8, 1921, and found to be in good condition and normal. Their blood failed to react to *Bacillus abortus* antigen. Cultures were made from the spleens on cooked blood-agar and glycerin-agar and incubated under 10 per cent CO₂ pressure until December 19, 1921, but remained sterile and were discarded.

OTHER CASES SHOWING BREEDING DIFFICULTIES

In addition to the cases reported above, Cow 1869 had a retained afterbirth in 1919 and Cows 1960 and 1965 had retained afterbirths in 1920. Cow 1953 had the same trouble in 1921. This latter animal was treated in 1919 for cysts in her ovaries and retained corpus luteum. Following her first calf, June 29, 1918, she did not come in heat until after treatment on March 12, 1919. She was then bred March 15, April 26 and May 28, 1919, becoming pregnant to the last service. She was born in 1914 and considerable difficulty was experienced in getting her pregnant the first time.

Following the conception of May 28, 1919, she calved normally March 12, 1920. She was bred again August 25, 1920, to which service she conceived and delivered twins April 18, 1921. At this parturition one of the fetal membranes was retained and had to be manually removed forty-eight hours afterwards. Little difficulty was experienced in removing the membranes, but considerable discharge from the uterus was observed April 27. She was treated April 29 and 30 with warm uterine injections of physiological salt solution followed by 1 per cent Lugol's solution, after which the discharge ceased.

FEEDING OF THE HERD

The milking cows in this herd are fed dry feed during about nine months of the year, from about June 15 to March 15. During the remaining three months, which constitute our green feed season, they are allowed to run on hillside pasture, getting practically all their feed in this way. The dry feed consists entirely of alfalfa hay as a roughage, with a somewhat varying mixture of concentrates. Beet pulp and coconut meal have been regularly fed. During most of the period covered by this report bran has been used as a third concentrate, but at times this has been replaced with rolled barley. The dry cows and young stock are kept on pasture during all of the year, it being sometimes necessary during the winter to feed them a small amount of hay. The bull is kept penned up during most of the time and fed dry feed. During the green-feed season he is usually given a few weeks on pasture.

SUMMARY AND DISCUSSION

In considering these cases, No. 1 is interesting from the fact that her dam has aborted twice. The possibility of the bovine uterus in some animals being inherently hypersensitive to overdistention to the point that expulsive contractions take place at certain stages of gestation, resulting in premature expulsion of the offspring, as has been observed in the human family, should not be overlooked.

Case 2 attracted attention at the time of the general examination of the blood of all the animals in August, 1920. While her blood serum gave an agglutination reaction to *Bacillus abortus* higher than any of the animals in the herd, it still never reached the point where it could be considered positive. Its agglutinating properties increased somewhat between August 30, 1920, and March 27, 1921, in that the — + reaction in 0.02 dilution of the former date reached a ++ in the same dilution on the latter date. Especial significance was given to this on account of the fact that she aborted on the latter date. The history of the animal does not reveal exposure to *Bacillus abortus* infection, and the large amount of work done on her fails to incriminate *Bacillus abortus* or any other infection.

Case 3 is of least significance on account of the fact that

there were twins and birth was so nearly at term. Death of both fetuses may have occurred during the parturition, as no attendant was present, and there may have been posterior presentations, or mechanical obstruction of the umbilical vessels may have occurred.

Cases 4 and 5 aborted twenty and ten days respectively after a bimanual manipulation of the genital organs in the diagnosis of pregnancy. These two cases, together with other circumstantial evidence which has come to our notice, lead us to venture the suggestion that such examination may, under certain conditions at present unrecognized, be responsible for abortion. It is the vaginal portion of the examination on which we place the responsibility if any can be placed on this procedure. Its value in the diagnosis of pregnancy in some cattle is so great that it can not well be dispensed with, but if it is a possible cause of abortion, it will have to be done with more care than is at present exercised when the opinion is so generally held that there is no danger of examination causing this phenomenon.

All the cases described in this paper occurred between September 16, 1920, and September 25, 1921, a period of about one year. If we exclude Case 3 as being doubtful, there still remain four definite cases of abortion in one year among about forty animals of breeding age. This is, therefore, 10 per cent of premature expulsions of the offspring in this herd without demonstrable cause. In addition we have had several retained afterbirths, failure to conceive, retained yellow body, etc., which conditions are frequently grouped under the manifestations of abortion disease. These animals will form a portion of a large group of animals which are to be utilized in abortion disease studies during the next five years, therefore rendering important a knowledge of their present status in regard to breeding difficulties.

What the Cow Gave

Want Ad in the *Wichita Falls Times*: "For Sale—A full blooded cow, giving milk, three tons of hay, a lot of chickens, and several stoves."

THE EFFICIENCY OF CARBON TETRACHLORID AGAINST HOOKWORMS IN THE SILVER BLACK FOX

By J. A. ALLEN

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IN A PREVIOUS COMMUNICATION (1) the economic importance of hookworm infestation in silver black foxes in captivity was outlined and the results obtained in experiments with chloroform and thymol were reported.

In the meager literature on parasitic diseases of foxes there is little recorded as to the prevalence of hookworms. Riley and Fitch (3) state that from the results of the examination of the feces of foxes from a number of farms and the reports in the literature they are led to believe that hookworm infestation is quite common. These writers have observed the presence of *Uncinaria polaris* in three out of four silver fox ranches examined, and state that this parasite was responsible for the death of young stock, and that the quality of the fur of infested animals was affected.

When writing our previous paper the information as to the prevalence of hookworms in the ranch fox was incomplete, and since then we have encouraged the ranchers in the vicinity to furnish us with carcasses of animals that die and to submit samples of feces from suspected foxes. In addition a large number of samples of feces have been taken for examination from foxes being exported from Canada.

In all 1,422 specimens have been examined, and 345, or approximately 24 per cent, showed the presence of hookworms. In some ranches the percentage of infestation was found to be as high as 65, and only a comparatively few ranches were absolutely free from infestation. In a number of cases hookworm eggs were demonstrable in excellent, full-furred foxes.

EXPERIMENTS WITH CARBON TETRACHLORID

In his experiments with carbon tetrachlorid on dogs, Hall (2) found that this drug administered in capsules in a dose rate of 0.3 mil per kilo removed 34 or all of the hookworms present

in nine experimental dogs. This worker employed smaller dosage in other experiments, but concluded that 0.3 mil per kilo was necessary to obtain the maximum efficiency.

Hall's report was published in April, when accurate experimentation with foxes is impossible because of the difficulty of securing experimental animals. The work had to be held over until the pelting season. It was not known just what effect carbon tetrachlorid would have on foxes, but in the meantime its use was suggested, and it was used with variable results by a number of fox ranchers. In a number of instances the dosage employed was too small for efficient results.

In our present series of experiments we followed the technique as outlined in our previous paper. The drug was given in gelatin capsules, and followed with a small quantity of castor oil to hasten swallowing. The animals were fasted for from 12 to 14 hours before giving the drug.

EXPERIMENT 1

In order to avoid eliminative work it was decided to begin our experiments with the dosage found by Hall to be efficacious in dogs, namely, 0.3 mil per kilo (approximately 5 minims for each 2.2 pounds of body weight).

Fox No. 249 passed 24 hookworms (20 of which were passed in the first stool) and 3 ascarids. When killed seven days later some petechiæ were found in the lower bowel; other organs were apparently healthy. One hookworm was found on post-mortem. This animal was malformed, being nearly as broad as long. Efficiency against ascarids, 100 per cent; against hookworms, 96 per cent.

Fox No. 250 passed no worms; none found on postmortem. Organs apparently normal.

Fox No. 251, same as No. 250.

Fox No. 252, same as No. 250.

Fox No. 253 passed 25 hookworms, and none were found when the animal was killed six days later. Hookworm eggs were seen in the feces for several days after treatment. Organs normal. Efficiency against hookworms, 100 per cent.

Fox No. 255 passed one hookworm and one ascarid. Organs found normal and no worms when fox was killed seven days

later. Efficiency against hookworms, 100 per cent; against ascarids, 100 per cent.

Fox No. 256 passed 3 hookworms in first stool; no worms found when killed five days later. Organs in good condition. Efficiency against hookworms, 100 per cent.

Fox No. 257 was found to be free from intestinal parasites; all tissue apparently healthy.

Fox No. 259 passed two hookworms. No worms were found on postmortem when held ten days later. Efficiency against hookworms, 100 per cent.

Fox No. 260 passed no worms, but had 2 hookworms and 3 ascarids when killed five days after treatment. Efficiency against ascarids and hookworms, 0 per cent.

Fox No. 261 passed one hookworm; none found on postmortem four days later. Organs normal. Efficiency against hookworms, 100 per cent.

Fox No. 262. No worms passed; none found on postmortem. Organs normal.

Fox No. 263 passed no worms; none were found on postmortem. Animal became constipated; bowels made to move with difficulty.

Fox No. 264 passed 6 hookworms and 4 ascarids. Animal died on eighth day. No worms were found. Animal lost one and one-half pounds in weight from time of dosing until death. Animal was underweight and anemic when treated. Efficiency against hookworms and ascarids, 100 per cent.

Fox No. 265 passed 1 hookworm; none were found on postmortem. Efficiency against hookworms, 100 per cent.

Fox No. 266 passed no worms; none were found on postmortem five days later. This animal became intoxicated and paralyzed before being released after treatment. Artificial respiration employed and animal recovered.

Fox No. 267 passed 3 hookworms; none found when animal was killed ten days later. Organs apparently healthy. Efficiency against hookworms, 100 per cent.

Fox No. 268. Samples of first stool thrown out by mistake. No worms on postmortem. No conclusion.

Fox No. 269 passed 1 ascarid; none found on postmortem eight days later. Efficiency against ascarids, 100 per cent.

Foxes Nos. 270 and 271 were found to be free from worms. Organs apparently normal.

Fox No. 272 passed 12 hookworms, and had retained 3 hookworms when killed seven days later. Efficiency against hookworms, 80 per cent.

Fox No. 273 passed 1 hookworm; none found on postmortem ten days later. Efficiency 100 per cent.

Fox No. 274 passed 1 ascarid. Efficiency against ascarids, 100 per cent.

EXPERIMENT 2

In the second experiment, double the quantity (0.6 mil per kilo) of carbon tetrachlorid was administered in capsules to four foxes.

Fox No. 275 passed 4 hookworms and retained none, giving an efficiency of 100 per cent. No toxic effects were noted, and the organs were apparently normal on postmortem eight days later. Transitory intoxication; recovered.

Fox No. 276, weighing 6 kilos, was given 3.6 mils of carbon tetrachlorid. There were no immediate or after effects, and the organs were apparently normal when the animal was killed eight days after treatment. No worms present.

Fox No. 277 was free from intestinal parasites. Organs normal.

Fox No. 278 passed 123 hookworms, 122 of which were voided during the first day after treatment, and 6 ascarids. This animal was stunted and weighed only 3.5 kilos. When killed one



Fox No. 278. One hundred and twenty-three hookworms were removed from this stunted and malformed fox during the first day after treatment with carbon tetrachlorid. Only 8 hookworms remained

month later no lesions that could be attributed to the drug were observed. Eight hookworms found on postmortem. Efficiency against ascarids, 100 per cent; against hookworms, 93.5 per cent.

EXPERIMENT 3

In the third experiment two foxes received the carbon tetrachlorid in drench. The animals were fasted as in the previous experiments and no purgative was given either before or after the drug.

Fox No. 279 was given carbon tetrachlorid on the basis of 0.3 mil per kilo. This animal collapsed inside of a few seconds, later became greatly excited, and recovered in half an hour. One hookworm was recovered from the feces, and none were found on postmortem. Efficiency 100 per cent.

Fox No. 280 was given carbon tetrachlorid on the basis of 0.6 mil per kilo of body weight. Animal became sick immediately. Staggered around pen, but recovered in ten minutes. One ascarid was passed and no worms retained. Efficiency against ascarids, 100 per cent.

DISCUSSION OF RESULTS OBTAINED IN THESE EXPERIMENTS

In all, 23 experimental foxes were given carbon tetrachlorid in capsules at the rate of 0.3 mil per kilo of body weight, and 13 of these were found to harbor hookworms in numbers varying from 1 to 25. The total number of hookworms present in these 13 animals was 85, and the treatment expelled them all but 6. An efficiency of 100 per cent was obtained in 10 out of 13 cases. Combining the results obtained in all cases, an efficiency of 93 per cent was obtained, which is a much higher index than that obtained with any other substance yet used against hookworms in foxes.

In Experiment 2 a remarkable efficiency is shown for carbon tetrachlorid in the case of fox No. 278. Only 8 hookworms remained after treatment, and 122 worms were removed the first day.

This experiment also indicates that double the effective dose as determined in Experiment 1 may be given without producing any apparent injury to the animal, provided the carbon tetrachlorid is carefully administered in capsules. If given in

drench, as in Experiment 3, distressing symptoms may be produced.

The chief danger lies in the difficulty of administering capsules to adult foxes. In their struggle to resist medication, the capsules are frequently damaged by the teeth, and some of the escaping drug may readily reach the trachea. Once carbon tetrachlorid, given in doses mentioned above, reaches the stomach, there seems to be little danger from absorption.

Fox No. 264 died four days after the administration of the drug, but this animal was unthrifty and emaciated when admitted to the experiment. In some few cases constipation was produced, but this did not occur with sufficient regularity to cause much annoyance.

In addition to the experiments recorded in this paper, 399 adult foxes were treated, under our supervision, by fox ranchers. The dose given was 20 minims, which approximates the average quantity of carbon tetrachlorid used in Experiment 1. The feces were not examined, and no conclusions can be drawn as to efficacy of the treatment; but only seven deaths were reported as a result of the treatment.

Although the number of ascarids present in the experimental animals was small, the indications are that carbon tetrachlorid has also a high index against them. This is in agreement with Hall's findings in the case of dogs.

COMPARISON OF CARBON TETRACHLORID WITH CHLOROFORM AND THYMOL

Chloroform.—In our previous experiments with other anthelmintics it was found that chloroform was inefficient, removing only 21 per cent of the hookworms harbored by 14 experimental foxes. Fifty per cent of these animals died as a result of the treatment.

Thymol.—This drug showed a high degree of efficiency (87.8 per cent) when given to foxes on the basis of 0.13 gram per kilo of body weight, with this dose repeated in two hours. From this dosage a mortality of 18.7 per cent followed, making its use prohibitive except during pelting time when the skins of the animals are marketable. When thymol was used on the basis of 0.065 gram per kilo of live weight and the dose repeated in two hours, an efficiency of 33 per cent was obtained, and

the mortality was reduced to about 6.8 per cent. One dose of 0.065 gram of thymol per kilo of live weight had little or no anthelmintic effect.

SUMMARY

1. When given to foxes at the rate of 0.3 mil per kilo of body weight (5 minims for each 2.2 pounds), carbon tetrachlorid showed an efficiency of 93 per cent against hookworms.

2. Only one death occurred among the experimental animals. This death was attributed to the poor condition of the animal.

3. When foxes are overcome by carbon tetrachlorid as a result of the capsule being broken while being forced into the pharynx, a number of these animals can be revived by artificial respiration.

4. Only 7 died out of a total of 399 foxes treated with 20 minims of carbon tetrachlorid.

5. Carbon tetrachlorid is more efficient and much less dangerous than either chloroform or thymol.

6. The indications are that carbon tetrachlorid is also efficient when used against ascarids in the silver black fox.

ACKNOWLEDGMENTS

My thanks are due to the fox ranchers of Prince Edward Island, who kindly furnished me with foxes for these experiments, and also to Dr. F. Torrance, Veterinary Directory General, Ottawa, and to Dr. E. A. Watson, Chief Animal Pathologist, Ottawa, for permission to publish this article.

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The British Ministry of Agriculture and Fisheries, as a means of helping young veterinary graduates to obtain facilities for further study and research work, has awarded two veterinary research scholarships of the value of 200 pounds sterling per annum.

PROPHYLACTIC VACCINATION OF DOGS AGAINST RABIES

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VACCINATION against rabies is one of the oldest methods of immunization practiced. Due to the magnificent work of Pasteur on the immunization against rabies, it is possible to avert the disease even after exposure. Hundreds of thousands of patients have been successfully protected by this form of vaccination, and even today it is considered the most suitable method for the prevention of the disease in man.

The Pasteur vaccine is prepared by drying the spinal cord of a rabbit artificially infected with the fixed virus of rabies over potassium hydrate for various lengths of time. Drying of the cord attenuates the virus to a certain degree and makes possible its injection into the exposed individuals with impunity.

In the Hogen method the attenuation of the fixed virus is eliminated. The method consists in grinding the brain of a rabbit artificially inoculated with fixed virus and injecting varying dilutions of this ground brain. Aside from a protective serum, which has also been successfully prepared, although found to be of no advantage over the other vaccines, all other methods of vaccination which have been developed and recommended are based on the same principle as the Pasteur and Hogen method; that is, the foundation of all the vaccinations is the inoculation of the patients with the fixed virus.

The term "fixed virus" designates rabies virus which by repeated and continuous passages through rabbits has become fixed for those animals in so far that it persistently kills them in from six to eight days. Such virus, through these passages, acquiring a greater pathogenicity for rabbits, is less virulent for other animals and man. It has been found that even comparatively large doses of such fixed virus will not produce the disease in other animals than rabbits. In taking advantage of this fact, Hogen developed the dilution method whereby he proved that in successive vaccinations with the fixed virus an immunity

may be produced which will effectively prevent the development of the disease in man and animals. The first injection is made with the very high dilution of virus and gradually the dilutions are reduced in the successive injections.

This method of immunization has also been employed to a very great extent in veterinary practice. The statistical data available show that in approximately 10,000 vaccinations of exposed animals only 28 developed the disease, which must be considered as splendid results, inasmuch as some of the vaccinations were undertaken after a considerable time elapsed from the time of exposure before the administration of the vaccine.

In all the methods, however, especially those employed for the prevention of the disease in man, a great number of vaccinations are required to produce the desired immunity. This factor naturally has a decided disadvantage in the application of this treatment in veterinary practice, in view of the fact that the animals in most instances have only an intrinsic value and only in a few cases is there any desire to save the animal for sentimental reason. As a result of this condition, the vaccination in animals has never been generally adopted.

If we consider, on the other hand, the causes which are responsible for the existence and the spread of the disease, we can not help but realize that the dog is the principal agent incriminated, and if we could effectively eliminate the prevalence of the disease in dogs there is no doubt that the disease could be controlled and eradicated. The long distances which rabid dogs travel, biting animals and persons met on their way, makes the persistence of the disease in localities and countries possible. Sanitary police and other legislative measures employed from the time of the earliest history of the disease could not effect its diminution. Muzzling, quarantining and prohibiting dogs to run at large have also failed in their purpose. In order, therefore, to control the disease effectively, investigators have aimed to develop a protective vaccination whereby it would be possible to vaccinate dogs against the infection so as to protect them against any natural exposure.

The possibility of injecting animals with altered fixed virus suggested itself as a means of an effective vaccination. Various investigators have proved that it is possible to confer upon

animals an immunity by the injection of such fixed virus. None of the methods suggested have ever been applied in practice for the purpose of protecting dogs which have not been exposed to the disease. More recently,¹ however, as a result of the tremendous spread of the disease in Japan through the war, they felt obliged to adopt some means whereby the ravages of the disease might be checked. Through the application of experimentally effective vaccination of dogs, they have proved in practice that it is possible to confer upon animals with a *single injection* a sufficient immunity which will protect them for at least one year against any bites to which they might be exposed by other dogs.

The vaccination consists of a single injection of a large dose of phenolized fixed virus. It is prepared by collecting and grinding the brain and spinal cord of a rabbit in which rabies developed in seven days from the injection of fixed virus. To this amount four times its volume of phenolized glycerin water is added. The glycerin water consists of 60 parts of glycerin to 40 parts of water containing 1.25 per cent phenol. This mixture was called the original vaccine and was stored at room temperature of 18° to 22° C. for two weeks, or in an ice chamber 30 days to reduce its virulence. When first used this vaccine was diluted to one-twentieth, but later it was given in a dilution to one-fifth, that is, in its original strength. This vaccine can be stored much longer than ordinary rabies vaccine, and from data it will remain active two to three months at room temperature.

Dosage of Vaccine.—When the experimental work was done, the dosage ranged from a fraction of a cubic centimeter up to 6 c.c., and the number of injections from four to one, and a dilution of from one-twentieth to one-fifth of the original vaccine to the concentrated original vaccine itself, which is diluted to one-fifth or 1 to 4. It was finally established that one injection of 5 c.c. per 15 kilograms weight of one-fifth dilution should be used, and that for puppies of 4½ kilograms or less one-half the dose of 6 c.c. should be given.

These findings were based on very extensive experimental work, and only after the experiments had proved the effective-

¹ A study of the anti-rabic inoculation of dogs and the results of its practical application, by S. Umeno and Y. Doi, in the Kitasato Archives of Experimental Medicine, vol. IV, No. 2, pp. 89-108.

ness of the method was vaccination undertaken on a large number of dogs in practice.

Since that time and up to 1921, 31,307 dogs were vaccinated in the Prefectures of Kanagawa and Tokio, with the results that only one animal died from accidental causes following vaccination and in only one case did the vaccination fail in producing a sufficient immunity against natural exposure. On the other hand, the disease continued to rage among the unvaccinated animals. The vaccination in these two prefectures resulted in a 75 per cent reduction in the number of cases of rabies, the disease occurring only in the dogs which were not immunized.

In order to prove whether such a high degree of immunity is actually produced by the vaccination, the writers undertook a series of experiments, the results of which are given in Table 1 and Table 2.

TABLE 1.—RABIES VACCINATION EXPERIMENTS ON DOGS.

DOG No.	DATE VACCINE INJECTED	AMOUNT INJECTED SUBCUTANEOUSLY	LABORATORY No.	DATE STREET VIRUS INJECTED INTRACULARLY	AMOUNT ¹	RESULTS
1	Oct. 4, 1921	5 c.c.	16	Oct. 29, 1921	0.05 to 0.1 c.c.	Living Feb. 15, 1922
2	do.	do.	16	do.	do.	do.
3	do.	do.	16	do.	do.	do.
4	do.	do.	16	do.	do.	do.
5	do.	do.	16	do.	do.	do.
6	do.	do.	16	do.	do.	do.
7	Control			do.	do.	Died Nov. 13, 1921, dumb rabies ²
8	do.			do.	do.	Died Nov. 14, 1921, furious rabies ²
9	do.			do.	do.	Died Nov. 15, 1921, furious rabies ²

¹ The infective dose of street virus was made up of a suspension of medulla and hippocampus of three different dogs known to have died of street rabies. The suspension was made up in the proportion of 1 gram to 10 c.c. salt solution.

² Diagnosis of rabies verified by microscopical findings and inoculation of rabbits. See Table 2.

To verify our clinical diagnosis of rabies in the three check dogs shown in Table 1, in each case the brain was removed, examination for Negri bodies made, and an emulsion from each brain reinoculated intradurally into two rabbits each as shown in Table 2.

As will be noted from the tables, the six vaccinated dogs successfully resisted the injection of a dose of street virus which proved fatal to the three controls, the latter developing the disease in from 15 to 17 days, which for dogs is considered

TABLE 2.—RABBIT INOCULATIONS TO VERIFY DIAGNOSIS OF RABIES IN CONTROL DOGS
TABLE 1.

RABBIT No.	DATE INJECTED	BRAIN FROM DOG No.	DATE DIED	REMARKS
1	Nov. 16, 1921	7	Nov. 16, 1921	Shock from trephining awl
2	do.	7	Nov. 28, 1921	Rabies ¹
3	do.	8	Living Dec. 8, 1921
4	do.	8	Dec. 1, 1921	Rabies ¹
5	do.	9	do.	do.
6	do.	9	Dec. 6, 1921	do.

¹Diagnosis of rabies verified by microscopical findings.

a short period of incubation; therefore, the injected dose of the street virus must be considered as highly infective.

These experimental findings would justify the conclusion that dogs vaccinated with a single injection of phenolized fixed virus may be protected against large doses of street virus. These results are of great significance, inasmuch as this method of vaccination offers a possibility of controlling, if not eventually eradicating, the disease. In localities where the disease is very prevalent, its spread might be checked by compulsory vaccination of all dogs. The advantages of a protective vaccination against rabies are not only of great importance from an economical and veterinary police standpoint, but more so for public health reasons.

STRASBURG TO CELEBRATE PASTEUR CENTENARY

The centenary of the birth of Pasteur is to be observed in May, 1923, by a great celebration at Strasburg, France, under the auspices of the University of Strasburg with the cooperation of the Pasteur Institute and the family of the distinguished scientist. It has been decided to erect a monument at the University, where Pasteur, as professor, began his career of fame. The ceremonies will include the opening of an exposition of hygiene and bacteriology to show progress due to Pasteur's discoveries. A congress of hygiene and bacteriology will also be held for the discussion of such problems as tuberculosis, cancer, syphilis, leprosy and filterable viruses.

At the last convention of the National Veterinary Association of Italy, held at Ravenna, an increase of membership from 1,300 to 2,000 was reported. The dues include the price of subscription to a professional journal.

THE VALUE OF ANAEROBIC CULTURES¹

By GEORGE W. STILES, JR.

United States Bureau of Animal Industry, Denver, Colorado

THE PREPARATION of anaerobic cultures probably does not constitute a part of the daily routine procedure in the average bacteriological laboratory. Doubtless there are exceptions to this general statement; however, unless one suspects the presence of anaerobes in a particular case, cultures to detect this type of organism are usually neglected.

Unless cultures are made to determine the possible prevalence of both anaerobic as well as aerobic organisms, one is not justified in concluding that the specimens under consideration are free from living bacteria or that all organisms present in some portion of the animal have been found.

During the past three years nearly 2,000 specimens of various kinds have been examined bacteriologically in the Denver Branch Laboratory of the Pathological Division, and in many instances, when aerobic cultures only were made, the results from bacterial growth were negative, but later, when some of these same types of tissues were cultured both anaerobically and aerobically, the results showed the presence of anaerobic organisms only, which specimens would previously have been considered sterile when aerobic methods alone were employed.

This is particularly true with the investigations being made on sheep losses resembling braxy. In this work the recent disclosures show the majority of specimens examined to contain but the anaerobic group.² During the month of December, 1920, 13 out of 18 sheep examined showed only anaerobic organisms from one or more of the viscera.

In the further discussion of this paper five divisions of the subject may be considered as related to the general theme.

I. KILLED SICK ANIMALS FOR AUTOPSY

According to various writers and personal experience, the selection of proper material is the first essential consideration in the study of any specimen for bacteriological study.

¹ Presented at the Fifty-eighth Annual Meeting of the American Veterinary Medical Association, Denver, Colo., September 5-9, 1921.

² Losses among sheep in the Rocky Mountain region. George W. Stiles, Jr. Jour. Amer. Vet. Med. Assoc., June, 1921, p. 322.

Representative cases showing visible evidence of illness from a herd of infected animals should, if possible, be slaughtered for autopsy purposes. From such carcasses portions of the lung, liver, spleen, kidney, glands, muscle and blood may be selected and preferably cultured at once. If this is impracticable the tissues should be either well iced or packed in a generous quantity of dry powdered borax and taken to the laboratory as quickly as possible for making cultures. In a few instances where fresh specimens have shown few, if any, organisms when first received, these same tissues, when held in the ice box for 24 to 48 hours, have shown a greatly increased number on the second examination.

Animals dying naturally from disease, particularly if allowed to remain for some time after death, are more liable to show a wider variety of bacterial flora, and especially saprophytic and putrefactive types from the intestinal tract; hence the value of cultures prepared from moribund slaughtered animals; also the chance of foreign tissue invasion is reduced, and the likelihood of isolating the causative organism is made more possible.

II. PREPARATION OF CULTURES

Doubtless each laboratory worker has his own method of making cultures; however, one general principle is recognized by all who are engaged in this kind of work. The nature of the culture medium used, its reaction and other characteristics, may vary according to the individual, but by following standard methods the personal element is reduced to a minimum.

In brief, one should remove from a specimen enough material by the use of heated spatula, platinum wire and sterilized instruments to insure a growth if any appreciable number of organisms are present. A small loopful of blood may not contain a single organism, whereas the inoculation of the 0.5 c.c. or more may insure growth. In making aerobic cultures, both liquid and solid media are desirable. Anaerobic cultures of course require the exclusion of free air from the medium used.

Recently sterilized Smith fermentation tubes have been conveniently used for liquid media, by introducing a small portion of tissue with sterile forceps beyond the bend of the tube. Various kinds of liquid culture material, such as plain or sugar broth,

milk, egg albumen and other substances, may be used in this manner.

Shake agar tubes, either plain or otherwise, are often used to advantage for primary anaerobic cultures. Such cultures may be made in conjunction with the liquid Smith tube cultures.

Incubation should be made sufficiently long to permit development of slow-growing organisms, should they be present.

III. SEPARATION OF SPECIES

The development of primary cultures, whether anaerobic or aerobic, may be a comparatively simple task, but their separation is not always such an easy matter. If aerobic species only develop, the plating method by using suitable solid media easily separates the colonies for their growth in pure strains.

When mixed cultures develop, containing both spore-bearing anaerobes and aerobes, the problem becomes more complicated. Aerobes may be separated by aerobic methods of growth. The anaerobes will require more skillful methods. Application of heat to the liquid cultures in the water bath may be an aid in separating the various types of bacteria.

For example, a liquid spore-bearing culture may be heated at 70° C. for a period of one hour or longer, and subcultures removed at intervals of every five minutes' exposure and transferred by pipette to a sterile Smith broth culture and incubated. This method would separate the nonvegetative, less resistant species from the spore-bearing types. Further purification may be necessary by using a series of dilutions in small shake agar tubes from the heated strain, and selecting a tube showing relatively few colonies for additional study.

The use of a low-power lens will aid in identifying the various types of deep anaerobic colonies in shake agar cultures. The gentle application of heat from the gas burner to the distal end of a shake agar culture will expel the contents into a sterile Petri dish. This column of agar containing well separated colonies may then be divided by a hot platinum wire into segments, each containing a single colony. The single fragments of agar containing but one colony are then transferred to suitable media for development. Several such colonies should be fished from the agar plug, particularly if there appears to be more than one type present, and further studied for determina-

tion of purity. When a culture is once determined to consist of a single species, then its pathogenic and biological features may be determined.

IV. PATHOGENIC PROPERTIES

The pathogenic properties of an anaerobic organism are usually determined on guinea-pigs, rabbits, white mice or other small animals. However, it is preferable to test the organism finally on the same kind of animals from which the strain was originally isolated.

Having separated the organism in pure culture, the matter of dosage to be given and the manner of administration will vary according to individual cases. Anaerobic organisms are generally injected either subcutaneously or deep into the tissues; they probably would not develop if introduced intravenously. A careful postmortem examination of the dead laboratory animal should be made, noting the presence or absence of swellings, gas in the tissues, distribution of lesions, conditions of each viscus, and finally, suitable cultures should be made to recover the strain injected into the animal.

V. CLASSIFICATION OF ORGANISMS

Having separated the organism in a pure culture and determined its pathogenic properties, its further identification may be accomplished by a study of its biological characters. Staining reactions, morphological characteristics, motility tests, its growth and behavior in various kinds of culture media, its ability to ferment sugars, liquefy gelatin, coagulate milk; all these aid in placing the organism in some known group of bacteria.

Bacteriological investigations of anaerobic infections present many complex problems. According to Heller¹ it is probable that many of the early anaerobic studies were made with mixed cultures, consequently the conclusions drawn were not justified in the light of more recent disclosures on strains developed from single colonies.

The recognition of the causative factor in the obscure diseases afflicting domestic animals is necessary before satisfactory

¹ Etiology of acute gangrenous infections of animals. A discussion of blackleg, braxy, malignant edema and whale septicemia. *Jour. Infect. Diseases*, vol. 27, No. 5, Nov., 1920, pp. 385-451.

progress can be made toward preventing or alleviating such maladies.

Through the study of anaerobic cultures, in addition to the usual aerobic methods, it may be possible to gain much information of value pertaining to these diseases which exact such a heavy toll of livestock annually.

RUSSIAN LIVESTOCK RAVAGED BY DISEASE

The ravages of animal diseases are not the least of the troubles that afflict Russia, according to a correspondent of the French *Revue Générale de Médecine Vétérinaire*. Rinderpest is said to be raging in all provinces and to have reduced the number of cattle by two-thirds. Glanders is widespread among horses. A clinical examination of 5,000 remounts at Kiev revealed 800 affected with glanders, and with no measures being taken to combat the disease it was believed to be only a question of time when practically all of these animals would become infected. Thousands of persons have contracted glanders, and special hospitals for their treatment have had to be provided.

The direction of the Russian veterinary service has been confided to a former hospital attendant in the Red army. He has established a Bolshevik veterinary school in which the course is reduced to one year.

It is easy to see, says the French journal, that the Russian flocks and herds are in danger of almost complete extinction, and that this condition is not without interest to the outside world.

Topeka Daily Capital reports that officials of the Russian government are purchasing horses by the thousands in Kansas, Colorado, and Wyoming, and concludes: "They are negotiating to have these horses slaughtered and the meat canned and shipped to Russia in train-load lots."

The Hon. José M. Collantes, Secretary of Agriculture, Commerce and Labor for Cuba, advised Secretary Mayo that a veterinarian representing his department will be sent to the next meeting of the American Veterinary Medical Association in St. Louis.

POISONOUS PLANTS OF THE WESTERN RANGES¹

By C. DWIGHT MARSH

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THERE WAS A QUESTION in my mind when I was invited to speak on this subject as to just exactly what I had better say. The subject is a very broad one. I might simply give a list of poisonous plants, but by so doing I would overstep the time. Twenty minutes would not allow me to give a list. I might take one plant and treat of it in detail. I should then overstep my time limit without any questioning. It seems to be wiser, before an audience of this kind, many of whom come from the East and are not especially familiar with western conditions, to speak in a general way in regard to some of the plants which are poisonous on the western stock ranges. I can not speak of all of them, of course. I can not speak of any of them in detail, and what I will say will be non-technical and sketchy of necessity. My idea, then, is simply to go over, very briefly indeed, just a few of the most poisonous plants of the West.

There are poisonous plants—plants poisonous to livestock—all over the United States, but the losses in the East are negligible as compared with those in the West. This results from a number of reasons. One is, of course, the different way in which livestock is handled upon the ranges. Cattle are turned loose, sometimes not seen for weeks, perhaps not for months, and drift upon areas of poisonous plants, perhaps at times when there is a shortage of other forage, and many, as a result, are poisoned. Sheep are generally kept under a herder and moved from place to place in more or less close formation. If, through the ignorance of the herder, they move over a patch of poisonous plants, some of them are likely to suffer. Many of the sheep are moved upon trails over which a large number go. They become very hungry, and if, upon emerging from these trails, they come upon poisonous plants, they suffer. Then there are more poisonous plants in the West than there are in the East, and they grow in larger numbers; that is, in larger patches.

¹ Presented at the Fifty-eighth Annual Meeting of the American Veterinary Medical Association, Denver, Colo., September 5-9, 1921.

In general, stock poisoning is due to shortage of food. I make that as a general statement. There are certain exceptions. For example, stock do get a loco habit; but generally speaking, no poisonous plants are eaten by choice. Shortage of forage is the main cause of the losses from poisonous plants. So far as remedies are concerned, there are few medicinal remedies that can be used under the ordinary conditions of handling livestock. There are certain plants for which we can have remedial measures, but generally speaking, that is not the case. Reliance must be put upon prevention and not upon cure.

Thinking it might interest you, I have brought in specimens of a few of our more common poisonous plants of the West. It is very difficult to get many of them at this time of the year.

(Fresh specimens of the following plants were shown: The whorled milkweed (*Asclepias galioides*); *Zygadenus*, or death camas; the western sneezeweed, or *Helenium hoopesii*; the Colorado rubber plant (*Hymenoxys*); high larkspur and aconite.)

I will now show a number of lantern slides and go over them rapidly.

ZYGADENUS OR DEATH CAMAS

Of all the plants poisonous to sheep, probably the one that occasions the greatest loss on the whole is the plant or plants known as "death camas," or *Zygadenus*. These plants grow all over our western ranges and are responsible frequently for losses of hundreds of sheep. The largest individual loss that I happen to be personally familiar with was 900 out of a band of 1,900. Similar losses are not at all unusual. The plant is, in the main, a spring plant, and the losses occur in May and June. The first work which was done by the Department of Agriculture on *Zygadenus* was done on a species growing in Montana, which is the species growing also commonly in Wyoming, and it was assumed that all forms of death camas were poisonous. Death camas is ordinarily called lobelia on the Pacific slope.

Zygadenus venenosus grows typically in California and in the States adjoining. It does not grow, so far as I know, in this neighborhood. The plant grows from a bulb and its leaves are grass-like. It has a group of greenish yellow flowers. All the species of *Zygadenus* resemble this. This particular species grows in

wet meadows and grows in such masses that it not only poisons grazing animals but sometimes makes the hay dangerous. *Zygadenus* poisoning results generally from a dosage of half a pound. The symptoms are salivation, nausea, vomiting, followed by great weakness. Sometimes a sheep will lie for hours or even days before death. Ordinarily, however, these cases are acute. *Zygadenus* will poison horses and cattle, too. It does not commonly cause fatal trouble with horses, but does make them very sick. It may also get cattle, but ordinarily, these animals are not seriously poisoned under range conditions.

Zygadenus paniculatus is the species of death camas that grows in the intermountain region. The leaves are thick and it grows on the dry hills, never in meadows.

Zygadenus elegans is the mountain death camas, which, in the West, grows only in the high mountains, 8,000 feet and more above sea level. It grows two feet or more in height.

Some botanists name other species of this plant, but these are the generally recognized species. We have been able in the last two or three years to get material of all these species and to determine experimentally their comparative toxicity. It has been shown that this particular plant, from which we have warned sheepmen for years, is so slightly poisonous that no stock are ever poisoned by it under range conditions. It has been shown that the *paniculatus* growing in the intermountain region is only about one-third as poisonous as the plant growing in Montana, or the plant growing in California. The plant growing in Montana is known as *Zygadenus gramineus*, but it looks very much like the other. These results in regard to comparative toxicity have been very interesting to us, and unfortunate in one way, because we have had to take back what we said before in regard to its poisonous properties.

THE LUPINES

Next to the death camas, probably the plants that get the most sheep are the lupines, the "blue bean" as it is sometimes called in the West; Indian beans, as we used to call them in the East. The leaves of this plant are not particularly poisonous, but the seeds are very poisonous to sheep, and the pods are somewhat toxic. It is a curious fact that sheep will graze upon these a whole season without harm if they do not eat a toxic dose within a comparatively limited time. The poison is not cumulative and

small quantities are eliminated. About half a pound of the seed will ordinarily poison a sheep. In the fall when they come from summer range and are trailed too rapidly, so that they become very hungry, if they come upon thick patches of lupine in pod, there are sometimes heavy losses.

A very unfortunate thing about our knowledge of lupines is the fact that we know so little about the different species. There are about 200 or 300 different kinds. Some of them are poisonous, some not, and at the present time we have exact knowledge only in regard to a very few of them.

An interesting thing about sheep poisoned with lupine is that they are likely to run about in a crazy way, butting into one thing and another. Animals poisoned in the corral will push their heads against the side of the corral and hold themselves in the same position by the hour.

THE LAURELS

There are in California two or three kinds of laurel that poison a great many sheep in the spring. The black laurels grow in limited patches. They are very easily avoided, but a great many sheep get upon them simply because the herders are ignorant in regard to the character of the plants. In California is another plant known as the white laurel (*Azalea occidentalis*) that gets a great many sheep in the spring. Eastern laurels are also poisonous to livestock, especially the mountain laurel (*Kalmia latifolia*) and the sheep laurel (*Kalmia angustifolia*).

COLORADO RUBBER PLANT

The Colorado rubber plant (*Hymenoxys floribunda*) is a very interesting kind of plant. As a matter of fact it has rubber in the base of the plant and has been exploited commercially. However, the quantity of rubber was not sufficient to make it profitable. This grows abundantly in parts of southern Colorado and northern New Mexico and is responsible for losses of a great many sheep, more particularly in New Mexico. The story among many sheep men is that the sheep masticate the roots and separate the rubber, which collects in masses and produces intestinal obstruction. This has no foundation in fact, and the story has probably come from the ordinary hair balls that are found in the stomachs of sheep. The plant, however, does poison and kill them.

THE LARKSPURS

Of the cattle-poisoning plants besides the loco, the worst without any doubt are the species of larkspurs. These larkspurs, for our purposes, may be called "high" and "low." There are a number of species. The low larkspur grows in this neighborhood in May and June. It dies about the first of July and disappears, while the high larkspur keeps on growing during the summer. The low larkspur sometimes grows in masses, and then it does a great deal of harm.

A white larkspur grows on the plains from Colorado down as far south as Texas, which is responsible for some losses of cattle. All these larkspurs are equally poisonous.

In larkspur poisoning on the range, generally the first thing noticed is that when the cattle are driven, they fall. In corral cases they step about uneasily, finally their legs double up under them and they fall, and they are unable to get up; yet they may rise within a few minutes and sometimes nothing more happens, or the thing may be repeated several times. If they are badly poisoned they go down upon the side, vomit, and die of respiratory paralysis. Eserin seems a sovereign remedy if given at the proper time. We have 95 to 100 per cent recovery where we have used eserine. Under normal conditions, however, if the animals are left alone with their heads up-hill, so that the stomach and intestines can fall away from the lungs, about 50 per cent will recover without any remedy.

SNEEZEWEED

Sneezeweed grows abundantly in Utah and also in parts of western Colorado. The eradication of this plant is difficult if not impossible, for it is a strong, healthy organism, reproducing both from seeds and from roots, and has no known insect enemies. In many places it has practically taken possession of the range.

Several years ago, while passing through Utah, we were told of a "spewing disease" of sheep. From the description we thought it was death camas poisoning, and men sent upon the range to examine the plants found an abundance of *Zygadenus*, and a diagnosis was made of *Zygadenus* poisoning. When our station was established on the range and we were able to make a careful study of the subject, it was found that the sneezeweed was the cause of the spewing sickness. When in blossom it is a

very beautiful plant. The effects of the plant are cumulative and permanent, and the microscopic examination of tissues has shown that a cure is probably impossible. I have sometimes seen thirty or forty sheep throwing up their heads and vomiting from the effects of this plant. We had reason to think that the sneezeweed might be poisonous to cattle under some circumstances, and it was fed out with that in view. Nausea and vomiting were produced.

WILD CHERRY

The wild cherry, which grows East as well as West, gets a great many sheep because of the hydrocyanic acid in it. The most prominent symptom is the gasping for breath because of the lack of oxygen.

WHORLED MILKWEED

The whorled milkweed has occasioned much trouble in western Colorado. For many years we had heard a great deal about milkweed poisoning, but until about four or five years ago nothing definite was known. At that time some very remarkable cases occurred in western Colorado. Two or three ounces of this plant will poison a sheep and a correspondingly small amount will poison cattle or horses.

The whorled milkweed grows in Colorado, Utah, Arizona and New Mexico, and is abundant in the valleys of the Colorado and Gunnison rivers. The plant will grow from a small portion of the root. It is impossible to eradicate it on that account. The whorled milkweed is very poisonous. Poisoned animals have the most violent convulsions.

There are several kinds of whorled milkweeds. We have been able in the last two or three seasons to make comparative studies of them. The Mexican whorled milkweed grows abundantly in the San Joaquin and Sacramento valleys in California and in some of the neighboring States. The dwarf whorled milkweed grows on the plains. It is only about a quarter as poisonous as the one growing in western Colorado. There is another one growing in the East that probably never poisons animals at all. While the Mexican whorled milkweed is only a quarter as poisonous as the Colorado plant, it poisons great numbers of sheep, particularly in California. The dwarf whorled milkweed, growing in the plains region, probably never does much harm because it does not grow in masses.

LOCO PLANTS

The ordinary white loco or rattleweed (*Oxytropis lamberti*) of the plains is the most common loco plant and the most destructive of all, because it poisons cattle, horses and sheep. The plant grows thickly in the Yellowstone Valley in Montana. The Texas loco, also known as purple loco, and sometimes called woolly loco, affects only horses as a rule. It grows in Nebraska and the States south and southwest. We know that there are a number of loco plants. The *Astragalus diphysus* poisons horses in Arizona and to some extent in New Mexico. It also affects cattle, although it is considered particularly a horse-poisoning plant. It may be called the blue loco. Another related plant poisons cattle and sheep in southern Utah, New Mexico and Arizona. Still another, *Astragalus tetrapterus*, which is limited in distribution, growing only in Utah and Nevada, poisons sheep and cattle.

Locoed animals lose a certain amount of muscular coordination. A comparison of the curves of weights of two young cattle, one addicted to loco eating and the other not, shows that the second animal gained continually, while the first began to lose soon after beginning to eat loco. Loco is a chronic poison affecting horses, cattle and sheep. Symptoms appear after eating the plant two months or more. Lambs sometimes will be poisoned in two or three weeks. Good food and treatment with strychnine for several weeks will go far toward overcoming the effects and make it possible to get meat animals into condition for marketing for slaughter.

Dr. R. A. Gregory, formerly with the B. A. I. at Texarkana, Texas, has recently purchased the Veterinary Hospital at Rogers, Ark., and has resigned from the Government service to reenter private practice.

Dr. Homer A. Wilson has just been appointed State Veterinarian of the State of Missouri to succeed Dr. D. F. Luckey. The JOURNAL extends to Dr. Wilson congratulations and best wishes for a successful term. He will make his headquarters at Jefferson City, Mo.

THE ECONOMIC IMPORTANCE OF ERADICATING TUBERCULOSIS ¹

By THOMAS E. WILSON

President, Institute of American Meat Packers, Chicago, Ill.

THE ECONOMIC IMPORTANCE of eradicating tuberculosis can best be appreciated when consideration is given to the enormous waste for which this disease is primarily responsible. Unlike many of the plagues affecting the animal kingdom, the ravages of this disease are not confined to any certain geographical areas, or to any one species of the animal kingdom, but instead it is widespread in its scope of destructiveness.

Tuberculosis, as a factor in our economic structure, cannot be overestimated. It has shattered and destroyed the fond hopes of home and fireside. It has transformed individual initiative and aspirations into lives of utter uselessness with all the accompanying sufferings and discouragements. It has plucked the bloom of health from thousands of our babes, children, and adults, thus depriving the nation of the man-power represented in a strong and stalwart citizenship that was or would have been. It has transformed successful careers into failures. It has brought suffering, sorrow, misery, and poverty to multitudes without any regard for age, sex, physical condition, or station in life. It has not confined its ravages to the human family alone, but has also extended its avenues of destruction to our domestic animals, thereby proving a menace to the livestock industry, and widening the opportunities for further spread by infecting an essential food supply of our people. It has shown a preference for the family and dairy cow, the foster mother of millions of our babes, and in the milk supply it has found for itself an excellent medium through which its deadly bacilli—if not prevented—are carried to helpless babes and the unsuspecting public.

Tuberculosis does not limit itself to infecting this important food (which also serves as an infective agent for extending its ravages to swine and calves) but further, the tubercule bacilli

¹ Presented at the Tuberculosis Eradication Conference, Chicago, Ill., November 25 and 26, 1921.

find their way into the excreta of the bovine, which greatly adds to the source of infection among swine.

The increase of tuberculous infection among swine during the last decade indicates that their eating habits constantly expose them to infection when they are required to associate themselves with tuberculous cattle. This, I think, constitutes a problem that can be readily solved through the eradication of the disease from cattle, and I therefore feel that the policy that is being pursued by you gentlemen in centralizing your efforts toward the eradication of the disease in cattle is fully justified.

Accepting, as we are obliged to, that the foregoing statements are facts, it would seem that this disease presents two important aspects, namely: Its relation to the public health, and its importance from an economic standpoint.

I will deal briefly with the subject strictly from the standpoint of its economic importance. It can be easily understood how the jeopardizing of the public health affects our economic situation. Anything that has a depressing effect upon our people cannot help lower the morale, an item which is considered of vital importance to the efficiency of any nation.

Tuberculosis saps the vitality and often the life out of those who are unfortunate enough to become infected. It thus reduces the energy of the man-power of the nation to an extent that must be recognized as contributing to a national waste, thereby lowering our standards of efficiency. Lost efficiency from any cause is economically unsound, therefore the eradication of this disease from the human family is of considerable economic importance.

The history of tuberculosis in the United States indicates that slowly but surely it has been the cause of diverting millions of dollars from avenues of production to that of being used in offsetting its own ravages, which are now recognized as a great agent of destruction.

Sanitariums, special hospitals, isolation camps and farms, milk-pasteurization plants, livestock sanitary and public-health departments, equipment and other expensive quarantine barriers and measures, Federal, State, county and municipal appropriations and indemnity funds, stand as monuments to the onward march of this disease. While these investments, equipment, organizations and expenditures of money are absolutely

necessary for properly executing our efforts to control this disease, or care for those afflicted, the economic advantages of eradicating it must be apparent to all.

As livestock sanitarians, you men are perhaps primarily interested in the economic importance of the eradication of this disease in its relation to the agriculture of the nation. The agriculture of the United States is peculiarly one of livestock, for the reason that a very definite percentage of all the grain produced is marketed through feeding it to livestock. Since successful agriculture is so essential to the prosperity of the nation, it is necessary that our attention be directed to the conservation of our livestock.

No one is more familiar than you gentlemen with the losses to the individual breeders and livestock producers as result of tuberculosis. You have seen purebred herds exterminated, that perhaps not only represented the savings of a lifetime, but also the loss of breeding animals of excellent types that represented the application of scientific breeding principles over several generations.

Under such circumstances, the loss is not alone with the individual, as such is keenly felt by the general agricultural interests of the nation. The production of inferior types or scrub livestock is economically unsound; therefore, the livestock industry can little afford to permit its breeding animals being sacrificed through the ravages of tuberculosis.

The individual and national losses are not confined to animals of pure breeds, but, instead, we know these losses are being experienced by the owners of cattle and swine of all breeds and grades.

The authorization of appropriations that permit the payment of indemnities was, I think, one of the best steps taken to encourage tuberculosis-control work. While these appropriations serve to reduce the losses to the individual, it must not be overlooked that each payment of indemnity indicates that a loss has been experienced both to the government and to the individual.

The economic importance of tuberculosis in its relation to the livestock production in the United States is reflected through the records of the Meat Inspection Division of the U. S. Bureau of Animal Industry for the fiscal year ended June 30, 1921.

During the period there were slaughtered under Federal inspection 8,179,572 cattle, of which 173,328 (which is in excess of 2 per cent of the entire kill) were retained on post-mortem inspection for tuberculosis. Of the total retained 33,328 of these cattle were condemned outright and destroyed for food purposes by inspectors of the U. S. Bureau of Animal Industry. Without giving any consideration to the direct losses represented through the condemnation of organs and parts in the retained carcasses, the total amount of beef represented in the condemnation of these cattle based upon a live weight of 968 pounds average on the Chicago market for the same period is equal to 17,421,212 pounds.

The hog kill under Federal inspection for the same period equaled a grand total of 37,702,866, of which 4,693,305, or 0.1212 per cent were retained for tuberculosis, and a total of 64,830 hogs condemned outright and destroyed by Federal inspectors for food purposes. On the basis of the average live weight of hogs sold on the Chicago market for this same period, the loss in the available meat supply showed 10,403,918 pounds. It must also be kept in mind that the total number of organs and parts condemned in connection with the retentions of swine for tuberculosis will far exceed the losses on the condemnation of carcasses. A presentation of the case on the basis of only taking into consideration the losses in the available meat supply from those carcasses which are condemned outright, is in itself very interesting. Using as a basis the per capita consumption of 154.3 pounds of meat per annum, and also that five persons constitute the average American family, the amount of meat loss is equal to a supply sufficient to provide the meat diet of 36,063 American families.

The packing industry is deeply interested in this great economic waste, which can not be measured alone in the loss of carcasses, organs and parts, but also added expense of operations in handling this class of carcasses in line with approved meat hygiene regulations.

The packing industry, like all other industries, is vitally interested in the supply and quality of its raw materials, and it, therefore, has closely observed for many years the changing conditions that have such a direct bearing on the conduct of the business. The industry has observed a gradual increase in the

public markets, and upon which freight, feed, yardage, and commission charges, etc., were paid. The condemned cattle in Federally inspected establishments for the fiscal year ended June 30, 1921, represented 1,515 carloads of animals supposedly healthy and fit for human consumption, but instead of their being converted into meat food products, they were destroyed for such purposes by being consigned to a rendering tank upon their arrival. The total number of hog carcasses condemned in the same establishments covering the same period, reached a total of 997 carloads, and the same disposition was made of them.

It is reported that some packing plants have as much as 40 per cent of their weekly kill retained for this disease. Under these circumstances such a plant is operating at a disadvantage, as it can not serve, to the best advantage, the community in which it is located, because of competition from the packing concerns that are fortunately located in sections of the country where there is less tuberculous infection.

One might go on at some length describing the many possible disadvantages and losses brought about by the prevalence of this disease in the United States, yet I realize that you men are here to discuss ways and means of improving upon the commendable work that you now have under your direction.

I can say to you that the Institute of American Meat Packers is vitally interested in your efforts, and it is the purpose of the officers and members of the Institute to assist you in bringing about a close cooperation between all agencies that are actively engaged in the work looking toward the control and eradication of this disease.

The packing industry, I think, has pioneered in connection with the systematic work that has been developed in connection with approved methods of control and eradication. As most of you men know, the industry had representation on the Sanitary Committee of the Chicago Live Stock Exchange, which committee was very active in its cooperative efforts with Federal and State departments in bringing about a recognition of the righteousness of your cause and the financial assistance necessary to inaugurate a general and well-defined plan for combating tuberculosis.

There are no doubt many people still unfamiliar with the im-

portance of your efforts, and I can see the necessity for continuing a campaign of education in order that all elements will become more appreciative of your efforts in the interest of the general welfare, which, in turn, should result in improving the well-established operations now in effect.

The packing industry, especially in Chicago, has worked very closely with the Sanitary Committee of the Chicago Live Stock Exchange, and many of the different packing companies have for several years been conducting special killing tests of cattle and swine in order to furnish first-hand information to the Live Stock Commissioner of the Exchange, who, in turn, not only used such information for locating points of infection, but also as a basis for getting the community interested in some plan of eradication work.

The work of the Chicago Live Stock Exchange has been commended by the U. S. Bureau of Animal Industry as being very beneficial to them in assisting in bringing about the cooperation necessary to fight tuberculosis. Results obtained through the activities of this committee were so encouraging that the work was finally taken up by the National Live Stock Exchange, which is now operating a similar cooperative plan on most of the large markets. This work, I think, has a great future, and I hope that, as in the past, it will continue to prove a valuable asset to your undertakings.

The industry realizes that tuberculosis presents so many different angles that it is necessary to maintain a proper interest and cooperation between all elements concerned. It is gratifying to note that many communities have taken up area work, and are demonstrating the practicability of eradicating the disease in certain specified areas. I believe that this plan has many possibilities, and I am quite sure that the packing industry will be glad to cooperate in any way that it can.

One of the problems which I know has given you some concern is the proper disposition of reacting animals. The Institute became interested in this matter, and by resolution signified its desire to cooperate fully by purchasing all reacting cattle subject to post-mortem inspection on the basis of paying for them the same price that is paid for animals of the same class not known to be reactors.

I must not go away from this place today without saying a

few words of commendation for the splendid achievements that have already been realized through your joint efforts. I think the United States is extremely fortunate in having at the head of this important work a man of such exceptional scientific and administrative ability. Dr. Mohler has pointed, and can continue to point the way. All he needs is the unstinted support and cooperation of all elements concerned. I am sure we can pledge this to him.

The nation is also fortunate in possessing a wonderful corps of livestock sanitary experts as are gathered here today. Gentlemen, we can not content ourselves with our accomplishments thus far, but, instead, we must firmly resolve to go forward.

We still have many problems confronting us, and if I may be permitted, it is my desire to briefly mention one or two. Our legislative bodies have been very considerate in legislating in the interest of appropriations and special quarantine laws. These laws in a degree are more specific in their application to the livestock owner than to any one else.

I hope to see the day when every citizen in this country will be cognizant of the fact that there are specific laws on our statute books that carry severe penalty for any one who attempts to traffic in tuberculous animals, or who by special knowledge of the tuberculin test, or by other means, will "plug," or in any way assist in such unlawful traffic.

Another matter which I personally feel is presenting a problem is that of bringing our milk supply and the by-products of creameries under proper sanitary control. We are all familiar with the fact that these products have an important bearing on the prevalence of this disease among swine and calves. It is extremely unfortunate for the livestock owner who cleans his herd of tuberculosis, only to find them reinfected through the medium of their calves who contracted the disease by being fed on skimmed milk originating at creameries and which had not been properly pasteurized. I sometimes feel that this question has some bearing on the high percentage of tuberculous herds that your test reveals in various States.

My experience with the problems of this disease is very limited. I speak on the subject from a knowledge gained through being both a breeder of livestock and a meat packer. I fully appreciate the fact that in this field alone there is yet a great deal

for me to learn, and I am quite sure that the same is true in the field in which you men are working.

The success of this work depends upon each one of you, and I am sure it goes without saying that you are now doing, and will continue to do, your work well. Should carelessness, or inefficiency of any nature ever creep into the ranks of our sanitary forces, we shall not only lose all that has already been accomplished, but more important still, possibly loosen the shackles from a plague that will continue to weaken further our economic fabric and add to the sufferings and losses in the human family.

Gentlemen, you are commissioned in an army that is going forward to give battle to the greatest enemy of civilization. Your generalissimo has the situation well in hand. Your leaders are generals of the best type. Their staff and line officers have won their stripes through practical experience, and every man serving on the front line, or in any other capacity has been thoroughly trained.

Your country is loyally supporting you and depending upon you. Your ammunition is the quarantine, the honest and sincere application of your scientific tests, and the proper disposition of all agencies of infection. The battle is on, and victory is the reward.

Breeder's Gazette says of scrub livestock: "Not only is there a fearfully expensive set of unprofitable boarders included in our livestock census, but there are vastly too many farms that are not yet even conditioned for the proper maintenance of livestock—either good or bad; all of which means that we have not yet bred up an established race of natural stockmen corresponding to the shepherds and herdmasters of Great Britain or the horsemen of the Perche. We have a start, to be sure. For the thousandth time we reiterate: Few farmers are rich enough to afford the luxury of scrubs around their places."

The last two horses of the London Fire Department were recently discharged from service with farewell ceremonies. The department is now provided with all motor equipment.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

SYNOVITIS OF SHOULDER OR OF HIP OF THE HORSE ALLAYED BY DEEP HYPODERMIC IRRITATION

By JOHN W. ADAMS

Professor of Surgery, Veterinary Department, University of Pennsylvania, Philadelphia, Pa.

SHOULDER LAMENESS in the horse is often a synovitis beneath the tendon of the biceps where it passes through the groove at the upper end of the humerus and just below the shoulder joint (intertuberal bursitis).

A hip lameness is often a synovitis beneath the tendon of the middle gluteus where it plays over the convexity of the trochanter major of the femur (trochanteric bursitis).

According to Hilton's Law, those nerves that supply the structures constituting a joint also send branches to all tissues covering the joint, so that stimulation of these branches reflexly produces cellular changes without and about the joint itself. Cutaneous nerves are extremely sensitive and blisters applied to the skin cause much pain and may leave permanent scars. In order to place the irritant closer to the inflamed synovial bursæ and thereby increase the efficiency of the treatment and incidentally to avoid the pain and possibility of blemish, I have for some years past been using for intertuberal and trochanteric bursitis a subdermal injection of a solution of iodine and potassium iodide. After considerable experimentation, I am prepared to recommend the following procedure: To one-half ounce of liquor iodi compositus (Lugol's Sol.) add one-half ounce of distilled water and five grains of potassium iodide; or to one ounce of distilled water add fifteen grains of iodine and thirty grains of potassium iodide. Cleanse the skin over the point of the shoulder or hip, lather and shave places the size of postage stamp where the needle is to be inserted.

On a shoulder I shave ten or twelve spots about two inches apart, the central spot being exactly on the point of the shoulder,

with the remaining spots distributed regularly on all sides of the central spot. Use a fine needle of 19, 20 or 21 caliber and at least an inch long. Apply twitch and hold up the opposite fore leg. Pinch up a fold of skin, pass the needle through the skin and when the subcutis has been reached turn the needle so that it stands vertical to the surface and press it in slowly but firmly till the point abuts against the surface of the biceps tendon, where it will stop. Inject 2 c.c. ($\frac{1}{2}$ dram) at each point. Over the point of the shoulder the tendon is near the surface and here the needle will not penetrate far, but around this point the needle will pass deeper, at some points to its full length. There is no danger with an inch needle of puncturing the shoulder or the hip joint, nor would harm be done if the joint were entered and injected.

After depositing 2 to 3 c.c. at each of the 12 or 15 places some 2 to $2\frac{1}{2}$ inches apart, smear the injected area with cosmoline or vaseline.

After injection the patient may be turned into a loose box. He need not be tied up or put on pillar reins, because he will not rub or bite the part. In 24 hours the injected area will be swollen and hot. Iodine in this strength ($2\frac{1}{2}$ per cent) will not cause necrosis.

For trochanteric bursitis, the central point is the center of the great trochanter, directly over the middle of the tendon of the middle gluteus muscle. The procedure is the same as for the shoulder.

Two weeks later, if some lameness remains, the procedure may be repeated at points between those marking the previous injection.—(*From the Veterinary Extension Quarterly, No. 5, Jan. 7, 1922, p. 3.*)

FORAGE POISONING ¹

By W. A. ANDERSON

Sleepy Eye, Minn.

IN BEGINNING I might say that I have selected a topic for discussion that is more or less familiar to most of us, but still a disease about which little is as yet known.

¹ Presented at the annual meeting of the Minnesota Veterinary Medical Association. St. Paul, Minn., January 13-14, 1922.

During the late Fall and early Winter we have learned to know, in my locality, of what great economic importance forage poisoning really is, and I think I can say conservatively that the loss in livestock in Brown and Redwood Counties in the past three months will amount to many thousands of dollars.

This malady was first recognized about 100 years ago, and since that time has been known by a number of different names, some of which are head disease, fever of the nerves, cerebrospinal meningitis, sleepy staggers, Borna disease, Kansas horse plague, botulism, and forage poisoning.

I think forage poisoning the best fitted and the most understandable name for this malady, although it is understood that the forage itself is not poisonous but is merely a carrier of the toxin.

On the morning of October 25, I was called in the country to see some cattle that the owner said had eaten too much corn, and upon arrival I found one cow dead, one stretched out flat upon the ground groaning and grinding its teeth, and a third lying in a natural upright position but unable to rise. Upon questioning the owner I was informed that these cows appeared in perfect health the evening before and gave their usual amount of milk. By noon the same day these three cows were dead and a fourth was down.

The symptoms manifested were as follows: Animals appeared very nervous, walked about with a trembling, staggering gait, soon lying down, and in a short time unable to rise. After an hour or so muscular twitching was noticed, mostly about the head, neck and shoulders. In an hour or two more the animals were stretched flat upon the ground; respiration labored, pulse fast, temperature normal, glassy expression of the eyes and a watery discharge from nose and mouth. There was some bloating shortly before death, which took place in from six to ten hours.

The postmortem examination showed petechial hemorrhage in heart, lungs and under surface of ribs. The subcutaneous tissue in the region of the throat and shoulders showed areas of congestion.

Treatment.—As a preventive cattle were kept from stalk fields and were fed grain and hay in the barnyard. It is my experience that the treatment of these acute cases with medicine is ineffective and useless.

Three herds were treated with botulinus antitoxin. In one herd a cow died from this disease two weeks after treatment. In the other two herds no sickness or death occurred, but these cattle were not allowed to feed in the stalk fields after treatment, therefore the results I have had from the use of the antitoxin is quite indefinite.

No poisoning occurred among horses on these farms.

RECTANGULAR MOUNT HYPODERMIC NEEDLE FOR SUBCUTANEOUS INJECTION OF CATTLE

By E. M. NIGHBERT

United States Veterinary Inspector, London, England

THIS NEEDLE, shown in the accompanying illustrations, has solved many of the difficulties for men in injecting large herds of cattle in applying the tuberculin test. Its use makes the work quick, safe and practicable to inject in the region of neck or shoulder, where the injection should be made, in order to observe the point of injection to better advantage.

The needle should be strong, sharp, large bore, and not more than one-half inch long from its shoulder.

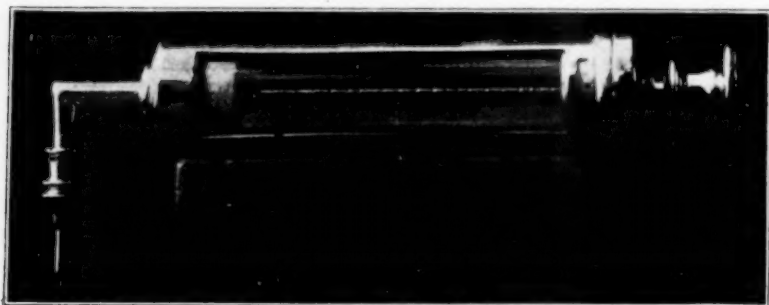


Fig. 1.—Rectangular mount hypodermic needle for subcutaneous injection of cattle

By use of the rectangular mount needle it is not necessary to pick up the skin in making the insertion. Simply thrust the needle straight through the skin, slightly lifting plunger-end of syringe, making injection with left hand. No matter what movement the animal may make, the operator always has full control in making the proper and a safe injection, no matter how tough or thick the skin, or how great the sensibility of the animal.

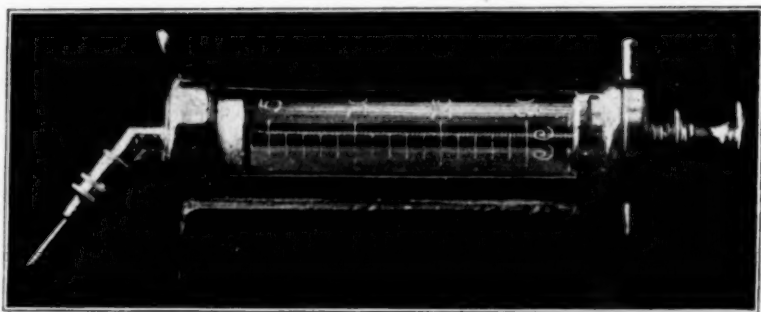


Fig. 2.—Modified mount hypodermic needle for subcutaneous injection of cattle

It is quite evident that when operators resorted to making injections of tuberculin in the region of the udder or coecyx it was for the purpose of avoiding as many difficulties as possible and making the work more convenient and pleasant, which are great advantages in treating large herds. With the rectangular and modified mount hypodermic needle it is now a pleasure for me to inject cattle of various dispositions and under varied conditions of poor light and poor assistants, compared with the use of the ordinary equipment.

ADVANTAGES OF THE RECTANGULAR MOUNT NEEDLE

The fingers are in contact with the needle near its point, which keeps it in proper position at all times, and the sensation of it passing through the skin is perceptible, which assures that the needle is in proper place and position for making the injection.

The danger of breaking needles or syringes is practically eliminated, simply be-

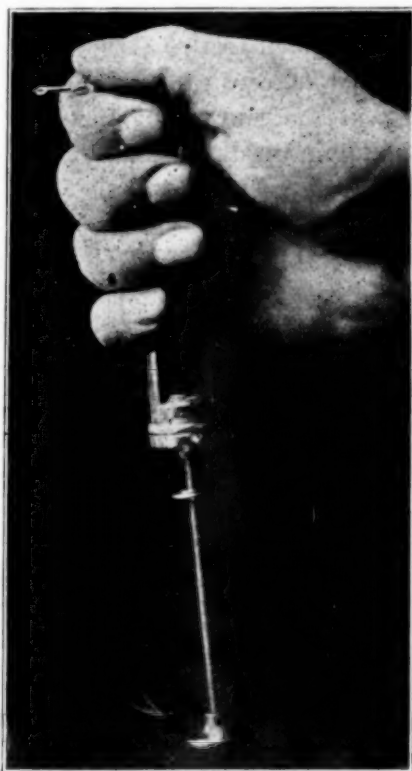


Fig. 3.—Proper position of rectangular mount needle for making injection

cause one has the syringe in his hand under full control and protection, instead of holding it with the thumb and two fingers, as is the case with the ordinary hypodermic needle used for subcutaneous work.

PRELIMINARY NOTE ON A NEW SPECIES OF GONGYLONEMA FROM AMERICAN SWINE

By EDWARD A. CHAPIN

Junior Zoologist, Bureau of Animal Industry, U. S. Department
of Agriculture

In examining specimens of various species of nematodes from domesticated animals, I have noticed that the species of *Gongylonema* from *Sus scrofa domestica* in the United States is not the same as that reported from this host in Europe. The worm is quite common in the pig in this country and in order that the literature may not be further confused, a name is hereby given to it.

Gongylonema ransomi n. sp.: Elongate, thin worm burrowing in the mucosa of the esophagus and tongue of the pig, similar in appearance to *Gongylonema scutatum* of cattle. Differs from all species of the genus except *G. verrucosum* by having spicules 10.3 mm. long, and from the latter by the lack of the dorsal ala.

Type: U. S. N. M. Helminthological Collections No. 24695.
Paratypes: U. S. N. M. Helminthological Collections No. 25047.

The type material was collected at East St. Louis, Missouri, in May, 1921, by Dr. J. S. Jenison. A complete description of this worm will be published in the Proceedings of the U. S. National Museum.

TESTIMONIAL TO PROF. PERRONCITO

Former pupils and colleagues of Prof. E. Perroncito are preparing to present a testimonial to that illustrious Italian parasitologist in view of his approaching retirement because of age. Foreign scientists are invited to have a part. Subscriptions may be sent to Prof. Faelli, chairman of the executive committee, at the University of Turin.

ABSTRACTS

THE FIGHT AGAINST TUBERCULOSIS IN CATTLE IN THE UNITED STATES. THE ACCREDITED HERDS. L. Panisset. Rev. Gén. Méd. Vét., vol. 30 (1921), no. 357, p. 505.

Panisset gives a brief history of the establishment and work of the Tuberculosis Eradication Division of the United States Bureau of Animal Industry, describing in particular the accredited herd plan. The eradication of tuberculosis by districts is also discussed; the results of the test in a county in Mississippi are stated.

In conclusion the author says that up to the present time, only four years since the beginning of the campaign, we are still only in the experimental stage. Several thousand herds are free from tuberculosis, it is true, and breeders have eagerly sought the accrediting of their herds, but will this plan continue to tempt the owners for a long time to come? To be fruitful and to realize the goal, the fight ought to be prosecuted without relaxation; any let-up may mean a recoil in the progress already made. The Bureau of Animal Industry is strongly organized and its policy is one of perseverance; but the eradication of tuberculosis demands a financial effort on the part of the State which may well cause one to fear lest it should not be sustained. Already Congress has appropriated recently a fund of \$1,500,000, directing that \$1,000,000 should be devoted to the payment of indemnities and \$500,000 should be reserved for carrying on the actual operations.

The eradication of tuberculosis is a titanic work, the accomplishment of which should be gratifying to the American genius. If the eradication is not realized, the work will help to make the herds healthy and this will be for the greatest good of rural hygiene and the public welfare.

L. T. GILTNER.

SALOL IN THE TREATMENT OF AVIAN CHOLERA. E. Huynen. Annales de Méd. Vét., 1921, pp. 286-287.

In acute cholera, give directly to the sick birds 20 to 40 cgm. a day (3 doses). For those birds that still appear well, mix the salol into a mash of bran or bread, or in water or milk. With

this treatment there was often observed an arrest of the epizootic of cholera in 3 to 4 days. In subacute cholera, which is generally accompanied by enteritis manifested by diarrhea, and also in white diarrhea of chicks, in which there is often a gaseous indigestion, the following mixture is used: 1 teaspoonful for 10 chicks, and three times that dose for grown fowls; salol 5 gms., powdered wood charcoal 20 gms. This treatment is continued for at least 10 days after the disappearance of the last case of the disease.

L. T. G.

STUDIES ON EXUDATIVE SEPTICEMIA OF GEESE. R. Reinhardt. Zeitschr. f. Infekth. etc. der Haustiere, vol. 21 (1921), No. 4, p. 257.

Material from outbreaks of this disease, which has occurred regularly each year in Mecklenburg, were obtained in 1913-14 for study. The affection appears in May and early June, and again in late August and September. Young geese are chiefly affected, although older birds are often attacked. The mortality among the young is 70 to 90 per cent. Only geese are spontaneously affected; other water fowls and chickens, pigeons and other domestic animals are not affected. The duration of an outbreak is about 2 to 4 weeks.

Symptoms.—Loss of appetite, ruffled plumage, great weakness, frequent sitting down, staggering, emaciation, diarrhea, bright whitish grey, thin and watery droppings. Sometimes edematous swellings of the legs; duration of sickness about 2 to 5 days; incubation period not definitely known; artificial incubation is about 12 hours; death in 24 hours, sometimes 48 to 72 hours, and exceptionally 5 days.

Post-mortem findings.—Skin and subcutis reddened, vessels congested, sometimes small hemorrhages in subcutis and muscles; in body cavity and air sacs there is a cloudy, sero-fibrinous exudate varying in amount from a very little to a considerable; sometimes organs adhere to neighboring parts by the fibrinous exudate; liver and spleen enlarged; mucosa of small intestine thickened and reddened, sometimes hemorrhagically inflamed; causative agent is a small fine rod 0.3-1 micron long, 0.1-0.2 micron broad. Gram negative, non-motile, no spores, grows best on serum or blood medium; sometimes not at all on plain agar; the

growth on solid media is delicate; not hemolytic, no growth in bouillon, lactose or glucose broth; no change in milk. It is killed at 55° C. for 30 minutes.

Geese may be artificially infected by injection and sometimes by feeding, but not by exposure to sick birds. Ducks were infected by injection but not by feeding. Hens, pigeons, sparrows, white mice, rats, rabbits and guinea-pigs could not be infected.

No agglutinins were demonstrated in blood of birds injected with killed cultures, or those that were sick with the disease. No immunity was observed in geese injected intramuscularly with doses of 1 to 2 c.c. of killed cultures in suspension in normal salt solution.

Measures for controlling the disease consist in separating healthy from the sick and suspects, cleaning up and destroying droppings, and disinfection of houses, etc.

L. T. GILTNER.

BOVINE APHTHOUS FEVER (FOOT-AND-MOUTH DISEASE) IS NOT TRANSMISSIBLE TO MAN; HUMAN APHTHOUS STOMATITIS IS NOT TRANSMISSIBLE TO BOVINES. Ch. Lebailly. *Compt. Rend. Acad. Sci. (Paris)*, vol. 172, May 2, 1921. (Abs. in *Rev. Gén. Méd. Vét.*, vol. 30, Sept. 15, 1921, p. 531.)

Notwithstanding the belief by physicians and veterinarians that aphthous fever is transmitted from animals to man by means of milk, Lebailly has not found a single case of human aphthous fever among numerous persons who were in contact with sick animals. Aphthous eruptions have been reported in Normandy in the absence of aphthous fever. A man affected with a severe aphthous eruption had received his milk for several years from a single farm on which the cows were free from aphthous fever. Attempts to transmit human aphthous stomatitis to bovines by subcutaneous inoculation gave negative results. Negative results were also obtained from efforts to transmit bovine aphthous fever to man by subcutaneous and intramuscular inoculation and by combining subcutaneous injection with exposure to aphthous virus for five minutes in contact with the internal surface of cheeks presenting slight erosions. "It seems legitimate to conclude from these observations and experiments," says the author, "that bovine aphthous fever and the aphthous stomatitis of man are absolutely distinct diseases."

ACTIVE IMMUNIZATION AGAINST FOWL CHOLERA. R. Manninger.
Deut. Tierarzt. Wochn., jrg. 29 (1921), No. 43, p. 543.

Immune serum usually affords only a transient protection (6 to 8 days) against fowl cholera and is of value only in cases where a passive immunity of short duration is sought. Manninger prepared a vaccine from a culture of an avirulent strain of the fowl cholera bacillus, with which he was able to secure a marked degree of immunity without causing appreciable local or general disturbances in the vaccinated birds. The vaccine was made by suspending the washed off growth of agar cultures in sterile physiological salt solution. The suspension was prepared so that each c.c. contained 5 mg. of bacteria, and the dose for hens was 1 c.c., and for ducks, geese and turkeys 2 c.c.

The vaccine was tried on a large number of birds and with few exceptions proved very satisfactory. The mortality from cholera in outbreaks in previous years has ranged from 80 to 90 per cent. Following the vaccination the losses were reduced to less than 10 per cent.

L. T. GILTNER.

TICK PARALYSIS. Sydney Dodd. Jour. Comp. Path. & Ther.,
vol. 34 (Dec., 1921), part 4, pp. 309-323.

In Australia *Ixodes holocyclus* Neum. "is capable of producing a very fatal form of paralysis in animals, the main feature of which is a progressive motor paralysis." Dodd succeeded in the experimental transmission of the disease by placing *I. holocyclus* on animals. A guinea-pig became paralyzed and died on the sixth day. A dog showed symptoms of paralysis on the eighth day and died on the ninth.

Tick paralysis seems to be common in animals on the coastal scrub areas of eastern Australia. Cases have been reported in man, cattle, horses and dogs. Dodd reports a case in a bandicoot which was brought to his laboratory. The animal died of paralysis five days later. Besides the symptoms of ascending motor paralysis, there were attempts at vomiting, continual stretching and yawning, and coma just before death.

"In commenting on a similar condition in America due to *Dermacentor venustus* Nuttall and Hadwen consider that the condition described by them is due to a toxin manufactured by the tick, and explain the apparent period of incubation by con-

sidering that the toxin is not injected into the host until the period of rapid engorgement has been reached. This may be the correct explanation as regards *I. holocyclus* also, but before finally accepting such a view, further research work is necessary."

Attempts to demonstrate an infective organism in the blood and cerebro-spinal fluid of affected animals failed. Supporting the toxin hypothesis, Dodd's cases took six days or over to develop. (The time taken for complete engorgement in ticks is influenced in some cases by fertilization, as females will not engorge fully until they have been impregnated by the male. —Reviewer's note.)

"The fact that if ticks are removed before symptoms set in, although they may have attached for a day or two, no paralysis results, can be used as an argument in favor of either hypothesis, viz: (1) living virus or (2) venom." Immunity is the rule after tick paralysis.

"Prior experimental work on tick paralysis has been successfully carried out by Hadwen and Nuttall. The present article deals only with the condition in Australia."

S. HADWEN.

EPIZOOTIC RABIES DISSEMINATED BY BATS AMONG CATTLE IN SANTA CATHARINA, SOUTH BRAZIL. H. Haupt and H. Rehaag. Ztschr. f. Infektkrkh. d. Haustiere., vol. 22 (1921), p. 104.

Since 1908 an epizootic raged in Santa Catharina which killed 30 per cent of the cattle and 15 per cent of the horses in certain localities. The pathological picture was the same for horses and cattle; *i. e.*, progressive paralysis involving the locomotor and digestive systems, with cerebral disturbance, ending fatally in 4 to 8 days. Autopsy and bacteriological examinations of fatal cases were negative. Diagnosis of rabies was established by finding Negri bodies, substantiated by inoculation tests on laboratory animals. The disease appeared as dumb rabies; there were enormous losses of cattle in regions free from rabid dogs. That the disease was spread by land animals was wholly improbable because (1) fatalities were greatest near woods and fewest in thickly settled regions; (2) the disease ap-

peared simultaneously on both shores of an impassable stream. In the affected districts bats have been seen flying by day. The abnormal behavior is believed to be due to their affection with this disease. A carefully guarded 8 day-old calf was bitten by a day-flying bat, and after 27 days became affected with typical dumb rabies. In a second day-flying bat captured in the act of biting a cow, rabies was established by rabbit injection. Cattle bitten by rabid dogs in the same neighborhood develop furious rabies. Well built stalls which can not be entered by bats are suggested for the protection of cattle.

W. N. BERG.

TREATMENT OF WOUNDS BY MEANS OF IODIN FUMES. Hébrant and Antoine. *Ann. Méd. Vét.*, Feb., 1921, p. 49. (Abs. in *Rev. Gén. Méd. Vét.*, vol. 30 (Sept. 15, 1921), p. 532.)

The authors have found the fumes of iodine, for use in the treatment of wounds, as proposed by Louge in 1911, to possess all the properties of tincture of iodine and to have the enormous advantages of being noncaustic and painless and permitting the treatment of wounds without dressing. The product used in generating the iodine vapors is iodoform, a very unstable product, which, under the action of moderate heat, is decomposed and gives off violet vapors of nascent iodine. These fumes projected on the wound, cover it with a thin antiseptic coating.

Since 1912, this method has become classic at the small-animal clinic of the Belgian Veterinary School at Cureghem. All accidental and operative wounds and open fractures have been treated with success by this process. Only in the case of wounds extending over a large surface is the treatment not indicated, because of the possibility of toxic effects from the absorption of iodine.

The application of the treatment is very easy, and several methods are at the service of the practitioner, among them the following:

- (1) A tuft of cotton sprinkled with iodoform is burned and the released vapors are directed on the wound.
- (2) Iodoform is introduced into a glass pipette at the wide end; the middle of the tube is heated gently, and the

vapors are directed on the wound from the slender end by the operator, who blows from the other end.

(3) An apparatus for applying the fumes is composed of a receptacle for holding the iodoform, closed by a screwed cover and provided with two tubes on opposite sides. One of these tubes is directed toward the wound and gives passage to the iodine fumes obtained by heating the receptacle. A rubber bulb attached to the other tube serves to blow the fumes out.

The fuming may also be accomplished by means of the cupping-glass and the thermo-cautery. The heat of the cautery decomposes iodoform sprinkled on the wound.

NEUFELD ON TUBERCULOSIS IMMUNIZATION

Professor Neufeld, director of the Berlin Institute for Infectious Diseases, recently published in the *Zeitschrift für Tuberkulose* an excellent critical survey of the prospects of specific tuberculosis therapy. His paper is reviewed by the Berlin correspondent of the *Journal of the American Medical Association* (Nov. 19, 1921, vol. 77, p. 1669). Neufeld concludes with the statement that in all attempts at immunization against tuberculosis a limit is set beyond which we can not go: "Let us not forget that in all forms of immunization we are only imitating Nature, which causes antitoxins to appear in the blood of a diphtheria convalescent and bacteriolytic substance in the serum of a cholera patient. To one who has recovered from smallpox or measles, Nature grants an immunity that often lasts his whole life through, but to the patient who has recovered from tuberculosis she denies this boon. He who sets for himself the goal, as many investigators persist in doing, of an immunizing process in tuberculosis comparable with that of smallpox is looking for something that does not exist."

As the outcome of the Second International Congress on the History of Medicine, held in Paris last summer, an International Society of the History of Medicine has been formed, with headquarters at Paris. The object is to unite persons interested in the history of the healing art, including physicians, veterinarians and pharmacists. The next congress will be held in London, July 17 to 22.

REVIEW

THE TOPOGRAPHICAL ANATOMY OF THE LIMBS OF THE HORSE.
O. C. Bradley. W. Green & Son, Limited. Edinburgh,
1920.

This book is one of the Edinburgh Veterinary Series issued under the editorial supervision of Dr. O. Charnock Bradley, Principal of the Royal (Dick) Veterinary College. It contains xi + 172 pages and 115 illustrations, and is somewhat more comprehensive than one might anticipate from the title, since it includes a considerable amount of systematic description and brief instructions for the dissection of the parts dealt with. We have learned confidently to expect good, substantial material in any publication from Professor Bradley's pen, and the present volume is further justification of our assurance in this respect.

The figures are without exception clear and sufficiently large to enable one to make out all details without difficulty. The arteries and veins are colored in the illustrations of dissections and sections. The author has been more fortunate than most veterinary writers in having at his disposal the artistic skill and accuracy of so eminent an anatomical illustrator as Mr. James T. Murray, who is best known to most of us through his excellent drawings in Cunningham's Anatomy. The standard of illustrative work is in general still regrettably low in most of our veterinary publications in English, and it is sincerely to be hoped that in the future we may have more of the type created by such artists as Mr. Murray. It is unfortunate, as the author explains in the preface, that the artist's instructions respecting the reduction of his drawings were not followed in a number of cases. Such neglect on the part of the block-makers is of course most annoying to author and artist, although the effect may not even be noticed by the average reader in most cases. But one might reasonably expect even a blockmaker to observe the disparity between figures 5 and 6. Some of the drawings—that reproduced in figure 8, for example—would doubtless have gained in artistic quality by further reduction, but on the other hand the reduction has in no case been carried so far as to destroy the clearness of the illustration.

With regard to the text the author is to be congratulated on his unusual ability in making it both brief and sufficient. The brevity of the descriptive matter will appeal strongly to the advanced student and to the practitioner who often wishes to refresh his memory on certain anatomical points in rather a hurry. He therefore appreciates concise statements and values, still more clear illustrations which assist strongly in enabling him to recollect anatomical details which are not as definite as they need to be for the business in hand. The lack of descriptions and illustrations adapted to practical requirements in much of our veterinary anatomical literature probably accounts in great part for the fact that veterinarians do not consult such works as much as their confrères in human practice do. The simple fact is that the information required is often given in such a vague form that it has little or no practical value or is scattered about in such a way that it is difficult for a busy man to assemble the data into usable shape.

The reviewer admires Dr. Bradley's courage in using the revised nomenclature throughout. This may interfere in some degree with the utility of the book among practitioners who grew up academically in the appalling jumble of names which still pervades most of our literature. But Professor Bradley is evidently looking forward and has adopted this course as the one which will eventually lead us out of the wilderness. In this connection the etymological footnotes will be very useful to the increasingly large number of students who know little or no Latin and no Greek.

Differences of opinion on certain points are inevitable. The reviewer is opposed to the use of the word "matrix" to designate the "corium" in the foot. It connotes a misapprehension and is almost as objectionable as the term "keratogenous membrane." The "stratum germinativum" might be called instead the "matrix" of the hoof without impropriety, since it moulds the corium embryologically and produces the hoof. It also seems undesirable to use the term "latus" with reference to parts of the corium, since it designates the "flank." There appears to be a slip of the pen with regard to the gender of "rete."

The reviewer regrets that Dr. Bradley did not see fit to provide some figures and descriptive matter relative to the superficial topography of the limbs, even if this had involved exclu-

sion of some of the systematic material. He has felt for years that careful study of the living subject by inspection and palpation is a very important part of anatomical training, bridging the gap between the dissecting room and the clinics. This method is well established in human anatomy and excellent figures and descriptions are available for its pursuit. It is highly desirable that a similar condition should exist in veterinary anatomy.

In conclusion it is a pleasure heartily to commend Professor Bradley's book to the veterinary student and practitioner, and to others interested in the horse for other reasons, as one of the most concise and accurate contributions to our knowledge of equine anatomy. We hope that other volumes will soon appear, until we have a complete account. S. S.

DISEASES OF ANIMALS IN SOUTH AFRICA. By C. R. Edmonds, M. R. C. V. S., Assistant Chief Veterinary Surgeon, Rhodesia. Published by Ballière, Tindall and Cox, London, 1922.

This publication consists of 477 pages, with 35 illustrations, and the subject matter is arranged as follows:

- Part I—Diseases Caused by Vegetable Parasites.
- Part II—Section 1—Diseases Caused by Animal Parasites.
Section 2—Diseases Caused by Insects.
Section 3—Diseases Caused by Worms.
- Part III—Diseases Caused by an Ultra-Visible Virus.

Apparently the author has produced a little book intended to give the practitioner a general survey of the diseases found in South Africa and a brief description of such diagnostic and therapeutic measures as are found essential in that country. In his preface the author states:

"The admirable works dealing with animal diseases in other parts of the world, and to which we in South Africa are greatly indebted, do not treat the diseases peculiar to this sub-continent in the manner, if at all, in which they have been chronicled from actual experience in this country by a number of veterinary surgeons and other writers in our agricultural press."

The author has displayed a discerning knowledge of the subjects and one cannot fail to be impressed by the manner

of presentation. The book throughout is distinguished by a pleasing simplicity and conciseness.

The printing, binding and general make-up reflect credit on the publishers, and in all, it is regarded as a useful little volume which should prove of value to veterinary practitioners, students and livestock owners, especially in South Africa.

U. G. H.

The number of students in attendance at the Royal (Dick) Veterinary College, Edinburgh, Scotland, during the session of 1920-21, according to the report of the Principal, Dr. O. Charnock Bradley, was even greater than during the preceding session, when it was unusually high. Candidates to the number of 161 presented themselves for the several examinations leading to M. R. C. V. S., and of these 74 per cent were successful, 20 obtaining honors.

Dr. Royal S. Copeland, Commissioner of Health, New York City, in a leading article in *Milk Reporter* says of the London milk supply: "There is sold in the city of London not a single drop of milk that would be permitted to be sold in New York City, even for cooking purposes. Over 10 per cent of the samples submitted contained tubercle bacilli, the germs of dread tuberculosis. When I explained to Lord and Lady Astor the significance of these bacteriological examinations they were shocked beyond measure."

Dr. Eugene Ferron arrived in the United States last month, having completed his contract at Guayaquil, Ecuador. He states that the Government there decided to discontinue the experiment station because of lack of funds. There was little money for the work last year, and the Animal Industry Department of the station was never started. Dr. Ferron's health has been poor for the past few months, so he decided to return to Philadelphia, Pa., and try a change of climate. As soon as he recuperates he expects to return to South America with a shipment of purebred stock for Ecuador.

ARMY VETERINARY SERVICE

NO AMATEURS WANTED

With reference to the issue of medical supplies to stable sergeants and possibly other noncommissioned officers of the line of the Army for the treatment of minor injuries to animals to be included in a wallet to be designated as "farrier's wallet," the surgeon general of the Army is forced to place himself on record as absolutely opposed to such issue to non-technical troops. He would take precisely the same position if it were proposed to issue medical supplies to the first sergeant of each unit for the treatment of minor injuries of men. His objection is based on the fact that a veterinary service, commissioned and enlisted, is now available throughout the Army for the care of sick animals precisely as such service is available for the care of sick men. Veterinary personnel is assigned to every station of any consequence and will be available with every regiment and larger unit in time of war. So far as known, it has never been proposed to attach medical personnel or to furnish medical supplies to units smaller than the regiment such as the company or troop. Under present conditions practically no sick or injured animal need lack the professional care of a veterinary officer and his trained enlisted assistants. It is stated:

The surgeon general confesses to a lack of sympathy with a proposal which encourages the practice of veterinary medicine by sergeants of the line under any circumstances. The Army can not, in his opinion, afford to develop and maintain a group of amateur horse doctors whose activities have in the past tended to discredit the science of veterinary medicine and will doubtless so continue in the future. The treatment of minor injuries is not a minor matter, because such conditions frequently result in prolonged disability and loss of life. Minor injuries are as much within the province of the veterinary officer as major ones. If the stable sergeant is to be equipped for this treatment there is no limit to the scope of his pseudo-professional activities, and, it should be noted, he serves under the instruction of the unit commander, entirely independent of the veterinary service, which by regulation is responsible for the care of sick animals. Without doubt the stable sergeant occupies a broad field of usefulness, in which much remains to be accomplished, without taking over the treatment of injured animals. The care and hygiene of normal animals is a most important

matter in which he, under the unit commander, can render most excellent service in keeping animals physically fit. No one else can do this work. It is vastly more important to keep animals well than it is to cure them after they are injured. It would seem that the best and most useful development of the stable sergeant's activities would be in this direction and that time and materials spent by him in treating the sick would be worse than wasted. In conclusion, the surgeon general urgently recommended the abandonment of the proposal to issue a packet of medical supplies to line sergeants, confidently believing that the first-aid packet to be developed and supplied every animal, together with the veterinary service now available, will meet every reasonable requirement.—*From Army and Navy Register.*

MEAT AND DAIRY HYGIENE SCHOOL

The following is a list of officer students and commissioned instructors in the Veterinary School of Meat and Dairy Hygiene, General Intermediate Depot, Chicago, Ill.:

Students: Capt. Jos. N. Hornbaker, V. C.; 1st Lieut. Joseph H. Dornblasser, V. C.; 1st Lieut. Raymond T. Seymour, V. C.; 1st Lieut. Samuel G. Kielsmeier, V. C.; 1st Lieut. Robert P. Kunnecke, V. C.; 1st. Lieut. Howard N. Beeman, V. C.; 2nd Lieut. James L. Barringer, V. C.

Instructors: Capt. H. S. Eakins, 1st Lieut. H. J. Juzek.

Officer in Charge of Instruction: Major George A. Lytle.

Commandant: Colonel Arthur Johnson, Inf.

Maj. Andrew E. Donovan, in addition to duties in office of surgeon, 1st corps area, Boston, will render veterinary service at Boston quartermaster intermediate depot, relieving 1st Lieut. Arthur D. Martin, who will proceed to Fort Niagara, N. Y., for duty as station veterinarian.

The editor has received a note from Dr. Olaf Schwarzkopf, Major, U. S. Army, retired, who is now visiting Coblenz, Germany. He and his wife left New York by steamer on November 10, 1921, arriving at Antwerp, Belgium, November 20, and then proceeded by railroad to Coblenz. He has already found many old friends among the officers stationed at that point. He and his wife are located in a "pension" in a country hotel

within a few minutes ride by railroad to the city. All around them are old "Burgs" of the Middle Ages and even foundations of ancient Roman castles. They get their drinking water for the hotel from an old Roman well in the rear of the building.

Major George Lytle, in charge of the Animal Food Inspection for United States Army at Chicago, was called to Washington recently to testify as an expert witness in a suit involving a contract for a large amount of bacon.

Lieutenant W. R. Wolf of the Army Veterinary Corps, and Miss Marie McCormick of Little Rock, Arkansas, were married at Little Rock on December 31.

Lieutenant and Mrs. Wolf have left for the Lieutenant's new station at Honolulu, Hawaii, where they will be at home to their friends after April 1.

Captain H. S. Eakins of the Army Veterinary Corps and instructor at the School of Hygiene and Meat Inspection, Chicago, was married on March 2 to Miss Marcelia Kinkade. Miss Kinkade was chosen "Queen of the Pageant of Progress" that was held last summer in Chicago.

A French army veterinarian has proposed that in the erection of war monuments the services of the horses and mules be recognized by placing a statue of a horse on the heights of Verdun and one of a mule on Hartmann peak in the Vosges Mountains. He quotes a French soldier-author who has written: "The battle of Hartmann was a combat of the mule against the railway. If a monument is ever erected on Hartmann, it should be a symbolic statue of a mule." It is said that in England a fund of 150,000 pounds sterling has been raised for erecting at London a monument to the memory of the 340,000 horses of the British army killed in the war.

ASSOCIATION NEWS

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was held in the Veterinary College building, New York, on December 7, at 8.30 p. m. President MacKellar presided. The minutes of the November meeting were read and approved.

Dr. John Payne Lowe, Passaic, New Jersey, read an excellent paper on State and Municipal Milk Control.

The doctor said that milk, one of the cheapest and most important foods for infants and invalids, was the most difficult to handle and transport without contamination. It should have its inception in a healthy cow. The problem is largely an educational one and the veterinarian from his training and interest, should counsel and assist the dairymen in his territory in the production of clean milk. He should be advised that it pays to be up to date in the installation of proper equipment and sound sanitary arrangements, and to have his cows regularly inspected and reactors eliminated. Milk laws should be enforced to prevent fraud and misrepresentation. Milk ordinances at the present time, vary too much. They should be more uniform in the various municipalities, made free from petty annoyances and thoroughly enforced without favor by the inspectors. The doctor considers that not enough weight has been given to the human element in the production of clean milk, and said the product of the most carefully conducted and sanitary dairy could be contaminated by a careless or dirty milker.

In the production of clean milk, eight factors had to be considered, (1) medical inspection of attendant; (2) physical examination of cows for udder and general diseases; (3) tuberculin test; (4) the water supply; (5) privies and manure receptacles screened; (6) cows thoroughly cleaned and milkers wash hands after milking cow; (7) utensils sterilized; (8) milk cooled to proper temperature promptly. Dairy barns should be constructed so as to be easily disinfected with abundant sunlight wherever possible. Separate calving pens should

be provided with maximum comfort for the cow. This paper produced a lengthy discussion by Drs. McKim, Beans, and DeVine.

The next speaker was Dr. John DeVine, who gave a splendid report of the U. S. Livestock Sanitary Association meeting, the Tuberculosis Conference and the Illinois Veterinary Medical Association—all recently held in Chicago. Under case reports Dr. Muleahy reported on a mongrel terrier, four years old, which had not passed feces or urinated in ten days. The doctor had given him castor oil, arecoline, jalap, compound cathartic pills, high enemata, exercise, etc., with no results. The consensus of opinion was that the dog was suffering from intestinal stasis or possibly a foreign body in the stomach or intestines. The Secretary read a letter from Dr. Robert Dickson, Little Silver, N. J., reporting a case of what he thought was osteoporosis in a four-months old Airedale terrier. None of the members present could report having seen bighead in dogs.

Dr. Victor Carabba and Dr. Frank Weirboar were unanimously elected to membership in the association.

This being the annual meeting, the reports of all committees were next in order. Dr. Clayton, Chairman of the Board of Censors, reported progress.

Dr. Berns, Chairman of Program Committee, said that they had succeeded in securing several good men as contributors to the program during the past year.

Dr. McKenney, Chairman of Prosecuting Committee, said they were investigating the case of two illegal practitioners.

The accounts of the Secretary-Treasurer having been audited by the Auditing Committee, he reported a balance in the treasury of \$125.17. This report was accepted.

The election of officers for the ensuing year then took place and resulted as follows: Dr. Robert S. MacKellar was unanimously reelected President; Mr. William J. McKinney was unanimously reelected Vice-President; Dr. J. E. Crawford was elected Secretary-Treasurer. The following five gentlemen were elected to serve as censors: Dr. Charles E. Clayton, Dr. C. G. Rohrer, Dr. Bruce Blair, Dr. C. W. Shaw and Dr. Edward A. Durner.

Dr. Berns announced that a memorial meeting would be

held in the College on December 12, in honor of the late Dean Hoskins.

It was regularly moved, seconded and carried that a hearty vote of thanks be extended to Drs. Lowe and DeVine for their valuable contributions to the program of the evening. No further business appearing, the meeting adjourned.

The January meeting of the Association was held in the Veterinary College building on January 4, 1922. President Robert S. MacKellar presided. The minutes of the December meeting were read and approved.

A general discussion on cribbing and windsucking, led by Dr. George H. Berns, was taken up. Dr. Berns recited the case of the race horse, Playfellow, which was recently causing a sensation in the newspapers. He said that cribbing and wind-sucking had been recognized for centuries and had been discussed by all the old writers on veterinary literature. He himself had always been skeptical about a horse being able to suck wind, and that in his experience of 36 years as a veterinarian, he could not recall a case of flatulent colic due to windsucking. As this vice was chiefly confined to the lighter types of horses, and since his experience was chiefly with the heavy draught horse, he would be interested in the views of men who attended to the Thoroughbred, Standardbred and light delivery horses. He stated that from an anatomical and physiological standpoint, it was practically impossible for a horse to swallow air in any appreciable quantities, that the grunting sound made in cribbing was due to the horse expelling gas from the stomach, rather than swallowing air.

Dr. C. W. Shaw said, in his opinion, there was no question but that a horse can suck wind in large quantities, when he learns the vice, and said he could cite dozens of cases of flatulent colic he attended to that were directly due to windsucking and that when a cribbing strap was worn there was no bloating.

Dr. McKinney said that he believed cribbing was due to habit and in a majority of cases to toothache in the incisor teeth. He had treated a number of cases of cribbing by cocainizing and scarifying the gums of the upper and lower incisors. In the majority of cases this method was successful. He said he sometimes applied a snug fitting muzzle with success.

Dr. Slawson said he himself can swallow air and that he can see no reason why a horse can not acquire the same habit. He believes the air is swallowed with the saliva which a cribbing horse produces by stimulation of the salivary glands.

Dr. Reid Blair said that gum chewers swallowed air with their saliva, and that if horses did swallow air he thought the air would be an aid to digestion, rather than a hindrance, but that in his opinion, a horse could not swallow air in appreciable quantities.

Dr. Ackerman said he had seen only two horses that could positively swallow air, and that in these cases, he believed it was due to a paralyzed or anatomical change in the throat.

Drs. Gannett, DeVine, Fleischman and McKim also joined in the discussion.

Dr. E. B. Ackerman recited the case of a Boston terrier bitch, 5 years old, which came in season about August 1. By October 1, she had all the appearance of pregnancy; he made an examination per rectum and could palpate what he thought was a fetus. By the end of the 10th week of supposed pregnancy, there was no sign of whelping. He advised a Caesarian operation. When he opened the abdomen, he found a large tumor weighing 5½ pounds, involving the stomach, liver, kidneys and intestines. He sent a section of the tumor to the Pathological Laboratory at Cornell and they pronounced it a spindle cell sarcoma of about 8 weeks growth.

Dr. Ackerman also reported the case of a Boston terrier, which was ill for 9 days with what he diagnosed as acute gastritis. Symptoms were constant vomiting, slight abdominal pains, thirst and emaciation. The dog was destroyed and a post-mortem held. Stomach, normal; intestines, empty and normal; liver, considerably enlarged, inflamed and very dark in color.

Dr. Higgins, of the Lederle Laboratories, in reply to the question, Is true carcinoma common in animals? said he found epithelioma quite common in hogs, occasionally present in dogs and horses, and that he found carcinoma frequently in fish, as large as a duck's egg.

Dr. Fleischman reported an obscure disease amongst a number of old horses which had been pensioned off on a farm. The

horses were well and liberally fed on good food. Sixteen horses had died in the past 2 months, and the doctor posted three. He could find no lesions.

Symptoms.—Recumbent position, unable to get up, would eat and drink water normally, gradually became helpless and death ensued in 48 hours. The consensus of opinion was that the horses were suffering from an obscure form of cerebro-spinal meningitis.

Dr. McKim suggested that the Association print a list of members, with names and addresses in booklet form, and then mail them to the members of this Association. The President said he approved Dr. McKim's suggestion, and asked the Secretary to give the matter his attention. The President announced the standing committees for 1922.

Program Committee: Dr. Reid Blair, Chairman; Dr. C. W. Shaw and Dr. George H. Berns.

Prosecuting Committee: Dr. William J. McKinney, Chairman; Dr. C. G. Rohrer, Dr. E. A. Durner, Dr. R. W. Gannett and Dr. Thomas E. Corwin.

Legislative Committee: Dr. Ray W. Gannett, Chairman; Dr. Robert W. McCully and Dr. Reid Blair.

No further business appearing, meeting adjourned.

J. ELLIOTT CRAWFORD, *Secretary*.

NATIONAL ASSOCIATION BUREAU OF ANIMAL INDUSTRY VETERINARIANS, METROPOLITAN DIVISION

A meeting of the Metropolitan Division, N. A. B. A. I. V., was held at the Veterinary College, New York University, New York City, December 14, 1921.

Twenty-four members were present with President Dr. N. L. Townsend presiding.

Dr. L. D. Ives called attention of the members to the fact that the By-Laws adopted at the time of organization were now inadequate, and moved that a committee be appointed to draft by-laws similar to those of the National Association, but with such changes as would be applicable to the Metropolitan Division. Motion was seconded and carried. The President announced that he would name the committee later.

In accordance with the plans of the Program Committee, Dr. Mullings read his paper on "The Technique of Post-Mortem Inspection." In presenting this paper Dr. Mullings stated that it was based largely on the regulations, service and regulatory announcements, and bureau letters of instruction. He announced his intention of distributing copies among the inspectors of the Jersey City station for their guidance in conducting post-mortem work and suggested that this also be done at the other stations of the Meropolitan district with a view to securing uniformity in inspections.

Dr. Mullings' paper went into details as to the procedures to be followed by inspectors in conducting post-mortem inspections and it was explained that the procedures described represented the minimum of requirements. In certain cases, as would be readily understood, more extended or detailed examinations than those described in the paper would be necessary, as the particular case or judgment of the inspector indicated.

Following the reading, Dr. Mullings' paper was discussed by all the members present. Particular points of interest brought out in this discussion were, the relative merits of palpation and incision in the examination for tuberculous lesions in lymph glands and other tissues; also in conducting post-mortem inspections of tuberculin reactor cattle; emphasis was placed on the care necessary in searching for lesions and the importance of forwarding specimens for examination in suspicious or doubtful cases.

In discussing the question of inspection of cervical glands in cattle, Dr. M. Paolone called attention to an important point. He referred to the fact that very frequently the atlantal lymph glands, forming part of the superior cervical chain, remain attached to the carcass when the head is severed. This was important to bear in mind in rail inspection as the atlantal glands are usually involved when extensive lesions of tuberculosis are found in the cervical glands.

It was agreed by all the members present that the paper read by Dr. Mullings and the discussion following, made this meeting a profitable one for all concerned, and the writer was given a vote of thanks. The Program Committee announced that Dr. L. D. Ives would present at the next meeting a paper on the "Disposition of Carcasses."

The February meeting was held at the Veterinary College, New York University, on February 15, 1922.

Twenty-nine members were present with Dr. N. L. Townsend presiding.

Reports of Committees: The Program, Auditing and Legislative Committees announced through their respective chairmen that there were no reports to present at this time. With reference to the matter of revision of the Constitution and By-laws by a committee, as authorized by resolution approved at the last meeting, the President announced the appointment of Drs. J. Huelsen, M. J. Murphy and H. S. Weber as members of this committee. Dr. Huelsen stated that he would report progress at this time. However, a meeting of the committee would be held in the near future to work on the revision, which would be submitted to the members at the next meeting. Dr. Huelsen stated that in the meantime the committee would be glad to receive suggestions of the members which would be of assistance in the preparation.

In accordance with the plan of the Program Committee, Dr. Leland D. Ives presented a paper entitled "Some Data on the Disposition of Carcasses under Regulation 11, B. A. I. Order 211." Dr. Ives' paper was devoted principally to tuberculosis, the most important disease from a meat inspection standpoint. It discussed the regulations pertaining to the disease and described briefly its pathology. In connection with the paper, Dr. Ives exhibited specimens of tuberculosis, illustrating various types of lesions and stages of the disease.

The reading of Dr. Ives' paper was followed by an interesting discussion in which all members present participated. Among the points discussed were the interpretation of the terms "slight," "well-marked," "extensive," "caseous," "Caseo-calcareous," "calcareous," etc. During the discussion, different cases of the disease showing a varied distribution of lesions, as found on the slaughter floor, were cited and the opinion of the members given as to the proper disposition.

At the conclusion of the discussion, the chairman of the Program Committee announced that Dr. Ives' paper had furnished a very interesting and profitable evening for the members, to which all agreed. Further, that the importance of the subject warranted an extended discussion for which the limited time

available at one meeting had hardly been sufficient. Therefore, the chairman announced it had been decided to continue the discussion of Dr. Ives' paper, including diseases other than tuberculosis, at the next meeting. E. L. SANDER, *Secretary*.

BRITISH COLUMBIA VETERINARY ASSOCIATION

At a general meeting of the British Columbia Veterinary Association, held in Vancouver on December 17, at which a report was received, as stated at the recent Ottawa Veterinary Conference, that there was a grave lack of attendance at the Veterinary Colleges in Canada, and a consequent scarcity of qualified veterinarians to safeguard the health of the livestock of Canada, the following resolution was unanimously passed:

Moved by Dr. Hoggan and seconded by Dr. Strong that this association inform the veterinary colleges in Canada that we do not feel justified in trying to increase their attendance until such time as they make some effort to better the condition of the existing veterinarians, as at the present time there is little inducement to enter the profession, and that this association deplores the lack of support given to the veterinary profession, the veterinary practitioner in particular, by the governments, colleges and daily and farm press, and be it resolved that the various efforts which at the present time seem to be directed to assisting the stock owner to do without the services of the veterinarian, are a detriment to the profession and not in the best interests of the stock owner.

And be it further resolved, That we deplore the present tendency of many B. S. A. graduates to pose as veterinary surgeons and that in the opinion of this association it is more important to see that the existing veterinarian receives a just reward for his skill and services than to turn out a number of young graduates who, when they experience the true condition of the profession, will leave it in disgust as many older and experienced, capable graduates are doing at the present time, and that copies of this resolution be sent to the Dominion Department of Agriculture, the Provincial Department of Agriculture, the Veterinary Director General, the Veterinary Colleges, the daily and farm press, and the *Canadian Veterinary Record*.

I might add that recently the entrance requirements and length of course at the Veterinary Colleges were raised to equal that of the Medical Colleges, but that there has not been a corresponding recognition of the increased value of the veterinarian's services, which I think accounts for the much smaller number of young men being desirous of entering the profession.

We would like you to assist in placing the veterinary profession in a better position, which it justly deserves.

A. J. DAMMAN, *President.*

VETERINARY ASSOCIATION OF MANITOBA

Members who attended the annual meeting of the Veterinary Association of Manitoba witnessed a demonstration of the intradermal and ophthalmic tuberculin tests and post-mortem examination of reacting animals at Gordon Ironside, conducted by inspectors of the contagious diseases and meat inspection divisions of the health of animals branch of the Federal Department of Agriculture.

There was a long discussion on tuberculosis in cattle, after an address by Dr. George Hilton, chief veterinary inspector, health of animals branch, Ottawa. The meeting was held at the Royal Alexandra Hotel.

"In from 18 per cent to 26 per cent of all deaths of children in Canada from tuberculosis, the disease finds its origin in milk from infected cows," said Dr. George Hilton, at the opening session. "The public must be convinced of the danger of milk from infected animals if we are to save the lives and prevent the maiming of thousands of boys and girls annually."

Investigation by authorities of the New York health department into the origin of human tuberculosis, he stated, had revealed 75 per cent of tuberculosis of the glands and bones in children was of bovine origin; 66 per cent of generalized tuberculosis and 10 per cent of all tuberculosis in children could be traced to the same cause. Cooperation between veterinarians, cattle breeders, and all parties concerned, he urged, must be secured to combat the disease.

Instancing the ravages of the disease, Dr. Hilton stated that in a small city in Ontario where 800 children were found

to have tuberculosis, federal authorities investigated a dairy whose milk had been recommended by physicians for the sanitary methods. It was found that 50 per cent of the cows of this model dairy were infected.

Discussing the control of animal food products, Dr. W. A. Shoults, provincial department of health, Winnipeg, declared that milk was the most valuable foodstuff, and at the same time one of the cheapest, because it combined all the elements necessary for the development and nourishment of all organs and tissues in the human body. It was, at the same time, most susceptible to contamination and was responsible for more sickness and deaths than any other foodstuffs. It was the product of an animal susceptible to diseases to which human beings were subject. Of these diseases the most common was tuberculosis, of which there were four kinds, the human, bovine, avian and fish, but the last two were not pathogenic for man. Of deaths of human beings, 9 per cent were caused by tuberculosis and 25 per cent of the deaths of children under 16 were caused by the same disease. Many persons, he declared, liked to have their milk from one particular cow, but this was a greater source of danger than the market supply, for the one cow might be suffering from tuberculosis. If the milk from many were mixed, the danger would be greatly diminished. He believed that many cases of septic sore throat were caused by infected milk.

Addresses were also given by Dr. N. V. James, Gladstone, Manitoba, on "Rare Surgical Cases Encountered in Country Practice"; Dr. J. Rowe Fisher, Brandon, on the "Use of the Stomach Pump," and Dr. H. N. Thompson, Virden, Manitoba, on "Goiter Affecting Livestock."

There was a little discussion on the advisability of establishing a schedule of charges for veterinary services, so that persons employing them for tests and other duties would know that they were not being overcharged and everybody would be satisfied.

A committee of three members was appointed to draw up a schedule. The opening session of the convention was devoted to a business program, at the conclusion of which officers for the year were elected. They are Dr. H. R. McEwen, president; Dr. J. R. Fisher, vice-president; Dr. J. B. Still, secre-

tary and treasurer; Drs. J. A. Munn, W. J. Thompson, W. Hilton, W. A. Shoults, councillors. Dr. Munn, presenting his report as delegate to the convention of veterinary surgeons at Ottawa, stated that the Dominion body had appealed to veterinarians throughout Canada to standardize their rates in order that good will might be maintained between them and cattle men.

J. B. STILL, *Secretary*.

CENTRAL MICHIGAN VETERINARY MEDICAL SOCIETY

The Central Michigan Veterinary Medical Society held its annual meeting January 6, at the Otsego Hotel, with a very large attendance.

In the absence of the President, Dr. H. F. Roberts, Dr. W. N. Armstrong, Secretary-Treasurer of the Society, called upon Dr. B. F. Killham, Chief Veterinarian of the State of Michigan, to act as Chairman. After a few well-chosen remarks, the latter called upon Dr. T. S. Rich, who is head of the Eradication of Tuberculosis in Michigan, to explain the proposed tuberculin test, which is to be started in Jackson County. Dr. Rich stated there would be at least 15 Federal and State veterinarians to complete these tests.

Roy Decker, Jackson County Agricultural Agent, gave a talk on the Relation of the Agricultural Agent to the Veterinarian, which was well received.

Dr. A. B. Curtis of Hillsdale, presented an interesting review of the result of the tuberculin test in Hillsdale County, during which he stated that cattle could not be shipped into the county without the tuberculin test made by approved veterinarians.

Dr. C. C. Mix of Battle Creek, gave a splendid talk on the intradermic tuberculin test and its technic.

Dr. John Hutton of the Michigan Agricultural College at Lansing, told of the situation of the livestock in relation to veterinary medicine. Statistics show that in 1921 the number of livestock in the United States was 203,355,000 and the valuation \$6,235,469,000. Milk cows have increased in number 2,498,000, at a valuation of \$558,000,000. The number of horses in the United States in 1911 was 20,277,000, and in 1920 20,184,000. Michigan had 602,410 horses at the time of the

April census in 1910 and 605,509 in January, 1920. Dr. Hutton stated that the draft horse was much more economical than the automobile for short hauls.

Dr. H. F. Palmer of Goshen, N. Y., spoke on veterinary practice in New York State.

Dr. H. M. Newton of the Bureau of Animal Industry at Lansing, spoke on hemorrhagic septicemia and necrotic enteritis in hogs, stating that hog cholera, though quite prevalent in the State, is not alarming at this time.

Dr. A. McKercher of Lansing, had for his subject the opportunities of the present-day veterinarian, which brought out much discussion.

Dr. E. F. Meyer of Jackson, was elected President; Dr. Fred Mains of Albion, Vice-President, and Dr. W. N. Armstrong was reelected Secretary-Treasurer.

A Program Committee was appointed, consisting of Dr. A. Campbell of Jackson, Dr. John Scott of Jackson and Dr. F. Richmond of Springport.

A dinner was served at the Otsego Hotel following the meeting, after which several good talks and smokes were enjoyed by the members.

A vote of thanks was given Manager Magmer of the hotel for the splendid manner in which the dinner was served.

W. N. ARMSTRONG, *Secretary*.

VIRGINIA STATE VETERINARY MEDICAL ASSOCIATION

The Virginia Veterinary Medical Association met in regular session in Richmond on January 12-13. This was one of the best meetings in its history. The papers and discussions were of high order. Dr. Kaupp of Raleigh, N. C., gave a very interesting report and discussion on diseases of fowls; Dr. White of the Bureau of Animal Industry, Washington, discussed hog cholera; Dr. Shultz of Goshen Laboratories was rather shy when introduced to the association and simply mentioned the fact that he was there only as a representative of the Goshen Laboratories, but not to appear on the program. He expressed to the association greetings from Dr. J. F. Devine, who appeared on our program the year previous.

The banquet which took place at 1.30 on the 13th, was the event of the association. We had gathered around the board Governor Westmoreland Davis, Lt. Governor-elect West, Attorney General Saunders, and a number of senators and representatives. The toasts given by these gentlemen were timely. The association adjourned to meet in Blacksburg, Va., at the Agricultural College on July 13-14, 1922.

W. G. CHRISMAN, *Secretary*.

IOWA VETERINARY ASSOCIATION

The thirty-fourth annual meeting of the Iowa Veterinary Association was held at the Hotel Savery, Des Moines, Iowa, on January 17, 18 and 19. The meeting was one of the most successful in the history of the association, both from the standpoint of attendance and interest in all sessions of the program. Approximately 350 veterinarians were in attendance. Good fellowship and a general feeling of optimism prevailed. Particularly evident was a feeling that every eligible veterinarian in Iowa should become a member of the association and take an active part in promoting its interests, which are the interests of the veterinary profession. Thirty-six new applicants for membership were approved at the business session, which gives the association a total active membership of 496. Enough applications have been received since the meeting to total 500. Following the meeting in Des Moines, 125 veterinarians attended a one day's clinical program arranged by the Veterinary Division of the Iowa State College at Ames which was devoted to the subject of sterility in cattle.

Following the address of President A. Kaderabek of Fort Dodge on the opening day, a paper entitled "Business Aspects of Veterinary Practice," by Dr. D. M. Campbell of Chicago, Illinois, editor of *Veterinary Medicine*, was presented. In the afternoon, Professor John M. Evvard of Ames, an authority on cattle and swine feeding, presented a much appreciated address on "The Feeding of Minerals to Livestock," and various other phases of practical cattle and swine feeding. Professor Evvard produced experimental data on results of feeding various rations and mineral mixtures, emphasizing that the veterinarian

should be as thoroughly familiar with such data as the livestock man to whom he is an adviser.

The remainder of the first afternoon was devoted to the subject of tuberculosis. Dr. J. A. Kiernan, of the Bureau of Animal Industry, Washington, D. C., presented an excellent address outlining the "Progress in the Eradication of Tuberculosis in Livestock," followed by Drs. R. A. Moye, of Manson, and J. H. McLeod, of Charles City, who presented papers entitled, "Interest of the Small Town in Tuberculosis Control," and "The Tuberculosis Situation," respectively, in which phases of the subject were discussed of direct importance to the practicing veterinarian interested in stimulating interest in tuberculosis control in his own community and with particular emphasis on methods of promoting public sentiment toward guarding the milk supply to the average small town. A general discussion on tuberculosis control followed, led by Dr. Peter Malcolm, State Veterinarian.

On Wednesday morning, Wayne Dinsmore, Secretary of the Horse Association of America, gave an illustrated talk on "America's Greatest Engine—the Horse—An Animal Motor." Mr. Dinsmore emphasized the strategic position which the veterinarian occupies for encouraging increased horse production in his community and offered to furnish valuable data which might be used in counteracting truck and tractor propaganda, and also serve to strengthen the veterinarian with his clients by furnishing him usable information relative to practical hitches, problems of draft, etc. The remainder of Wednesday forenoon was devoted to papers and discussions on surgical topics. Drs. W. A. Aitken and G. W. McNutt of Ames presented an illustrated talk on the "Sinuses of the Ox," which was followed by a practical discussion by Dr. H. E. Bemis of Ames, on "Some Surgical Operations in Cattle." Dr. Bemis discussed proper methods of draining the sinuses in cattle, also operations on the eye, rumen, removal of actinomycotic growths and other tumors, and surgical drainage of certain areas. Dr. O. N. Schultz of Latimer presented a paper, "Operative Treatment of Umbilical Hernia in the Male Pig," followed by a paper on "Obstructive Hyperemia Treatment in Veterinary Practice," by Dr. W. E. Norden of Avoca. Dr. J. S. Schoenenberger of Winterset gave

a practical talk on "Methods of Animal Restraint," in which time saving methods in general practice were illustrated.

On Wednesday afternoon, following a number of case reports by Dr. H. L. McMillan of Estherville, on "Fractures" and "The Use of Acriflavine in Open Joints," and by Dr. R. J. Laird of Algona, on "Hemorrhagic Septicemia in Cattle," a paper entitled "Botulism in the Field," by Dr. John B. Bryant of Mt. Vernon was presented. Following this Dr. A. Eichhorn, of Pearl River, N. Y., gave a highly interesting talk in which he reviewed the progress made in the control of infectious diseases of animals, dwelling particularly on rabies, anthrax, blackleg, hemorrhagic septicemia and hog cholera. Dr. Eichhorn's address brought out many questions and interesting discussion.

Thursday forenoon was devoted largely to a business session, including reports of the Committee on Legislation by Dr. C. H. Stange and the report of the Executive Committee by the Secretary, H. D. Bergman. The Secretary-Treasurer's report showed the Association to be in good financial condition. The following officers were elected for the new year: President, E. A. Buxton, Vinton; First Vice-President, H. R. Wesson, Scranton; Second Vice-President, Guy S. Jones, Rockwell City; Secretary-Treasurer, H. D. Bergman, Ames (reelected); Member of Executive Board, John Patterson, Hedrick. During the business session considerable interest and discussion developed relative to inviting the American Veterinary Medical Association to meet in Des Moines in 1923. Following discussion by various members and the Secretary of the Convention Bureau of the Des Moines Chamber of Commerce, the association voted unanimously to invite the A. V. M. A. to meet in Des Moines in 1923.

Following the business session the day was devoted to papers and discussions as follows:

"Our Knowledge of Swine Diseases," by Dr. C. H. Stange of Ames. Dr. Stange emphasized the importance of veterinarians recognizing hog cholera as the most important, most prevalent and highly fatal disease of hogs, avoiding the use of immunizing agents, the value of which is questionable or unknown, and of studying more closely the housing, feeding and care of swine. Dr. Chas. Murray of Ames presented an instructive paper on "Diseases of Poultry," in which the importance of this field of practice was emphasized and enumerated the most prevalent

diseases of poultry, outlining preventive measures and treatment. Dr. E. A. Logan, of Kansas City, Kansas, presented an interesting paper on "Immunity, Its Theories and How Produced." A Question Box opened during the day precipitated some very interesting discussions along various lines of importance to the profession.

Dr. S. H. Johnston, of Carroll, presented an excellent report from the Committee on Resolutions. One of the important resolutions adopted unanimously by the association was as follows:

WHEREAS: The objects of this Association are to promote good fellowship; to elevate the standards of veterinary education; to cultivate medical science and literature, to enlighten and direct public opinion regarding state problems of veterinary medicine; to contribute to the diffusion of true scientific knowledge among its members by the reading and discussion of such papers and reports of cases as may come before it; and,

WHEREAS: It is not the object of this Association to determine proper compensation for services rendered which must vary greatly under different conditions,

Therefore, Be It Resolved: That the members here assembled approve and encourage the efforts of our members who by conduct, professional services and other efforts are endeavoring to strengthen the profession and promote the livestock industry; and,

Be It Further Resolved: That we disapprove and condemn the practices and methods of a few who are thereby bringing discredit upon the profession and injury to the animal industry of the state; and,

Be It Further Resolved: That we disapprove of profiteering in the handling of hog cholera serum and other biologics by the few veterinarians, whether members of this Association or not, who thereby bring condemnation upon the entire profession, and which will interfere with the future confidence of livestock breeders in the work of our profession.

No evening sessions were scheduled during the meeting, the evenings being left open for general getting acquainted, class and group reunions, committee meetings and recreation in general. The open evenings were apparently appreciated and resulted in excellent attendance and attention during the day sessions, as high as 300 being in attendance at some sessions.

H. D. BERGMAN, *Secretary.*

MISSISSIPPI STATE VETERINARY MEDICAL ASSOCIATION

The sixteenth annual convention of the Mississippi State Veterinary Medical Association convened in Gulfport on January 23 and 24 with 83 members and friends in attendance. The convention was opened by a fine address of welcome by the Mayor of Gulfport, to which a response was made by Dr. J. A. Barger of Jackson.

The following is the program rendered: "Tuberculosis Eradication and Control Work," Dr. Elmer Lash, Bureau of Animal Industry, Washington, D. C.; "The Treatment of Stomach and Intestinal Worms of Cattle and Calves," Dr. Dikmans, University of Louisiana, and Dr. Gandy, Assistant State Veterinarian of Louisiana; "Review of Progress Made in the Control of Infectious Diseases of Animals," Dr. Adolph Eichhorn, Pearl River, New York; "Anthrax and Its Control," Dr. S. H. Wood, Berkeley, California; discussion by Dr. O. M. Norton, Greenville, Mississippi; Dr. E. B. Mount, Cleveland, Mississippi, and Dr. C. C. Brown, Assistant State Veterinarian of Tennessee; "Botulism and Botulinus Antitoxin," Dr. C. E. Salsbery, Kansas City, Missouri; discussion by A. Eichhorn, S. E. Osborne and others; "Things We Are Up Against in Every-day Practice," Dr. C. L. Duckworth, Brookhaven, Mississippi, and Dr. I. W. Edwards, Vicksburg, Mississippi; "Swamp Fever, Differential Diagnosis and Treatment," Drs. W. L. Gates and M. J. Luster, Clarksdale, Mississippi; "Veterinary Education," Dr. C. A. Cary, State Veterinarian, Auburn, Alabama.

All of these subjects dealt with were pertinent to the practitioners of this section and considerable valuable information was obtained.

Anthrax, which claims a toll of many hundred animals each year in the delta section of this State, where it is considered by a great many that the organism is more virulent than in other sections of the country, was possibly the subject given the most attention at the convention, and it is considered fortunate that Drs. Eichhorn, Salsbery, Wood and Cary were present and furnished additional information regarding the control of this disease.

A large buck deer which had been killed by Drs. E. C. O'Neal, D. J. Bynacker and S. H. Davis the previous day

formed a part of the menu of the sumptuous banquet which was served to the members, friends and ladies at the conclusion of the first day of the convention. The second day was devoted entirely to sightseeing along the Gulf coast, which is known as Mississippi's winter playground.

The following officers were elected for the ensuing year: Dr. J. A. Barger, Jackson, President; Dr. M. J. Luster, Clarksdale, First Vice-President; Dr. I. W. Edwards, Vicksburg, Second Vice-President; Dr. H. L. Fry, Jackson, Secretary-Treasurer.

J. A. BARGER, *Ex-Secretary*.

PENNSYLVANIA VETERINARY MEDICAL ASSOCIATION

The Pennsylvania State Veterinary Medical Association held its 1922 meeting at Harrisburg, January 24 and 25. The week of January 23 is known as Agricultural Week in Pennsylvania, and the State Veterinary Medical Association being one of the Allied Agricultural Associations, holds its meetings at the same time that the other allied organizations are holding their meetings.

Holding our meetings at the same time that the other organizations are in session has the distinct advantage of bringing the practitioners of Pennsylvania into close contact with the livestock owners, and gives the stock owners an opportunity to see that the veterinarians are well organized and a representative group of men who are taking their proper places in agricultural activities.

Pennsylvania meetings are very well attended. Our usual place of meeting would have accommodated our own number, but the attendance had been increased to such an extent by livestock men that this year the committee of arrangements secured the Hall of the House of Representatives in the Capitol Building. This hall was filled to capacity on the second day of our meeting.

The program, as published in a former issue of the JOURNAL, was carried out in its entirety. Papers of every-day interest to practitioners were presented by practitioners, and every section of the State was represented. This was made possible by inviting the officers of each veterinary club in this State to desig-

nate one man to present a paper at the State meeting and two men to discuss their fellow member's paper. Any success that the meeting may have attained is due to the good cooperation of the men appearing on the program.

It has been the practice of our association to publish the proceedings of our annual meetings, and it is hoped that means will be devised whereby the 1922 proceedings may be published. If this is not accomplished in a single publication, it may be found possible to publish the papers through other channels.

Election of officers resulted as follows: President, E. E. Bittles, Waterford; Vice Presidents, H. B. Roshon, Reading; B. M. Beattie, Chambersburg; M. A. Davis, Troy; Recording Secretary, C. S. Rockwell, Philadelphia; Treasurer, Thomas Kelly, Philadelphia; Corresponding Secretary, R. M. Staley, Philadelphia; Trustees, John W. Adams, Chairman, Philadelphia; H. E. Bender, Lititz; L. A. Klein, Philadelphia; John Turner, Wellsboro.

R. M. STALEY, *Secretary*.

MICHIGAN VETERINARY MEDICAL ASSOCIATION

"We Represent the Protectors of a Ten Billion Dollar Industry," was the wording of a banner prominently displayed in the Surgery and Clinic Building at the Michigan Agricultural College when the Michigan State Veterinary Medical Association held its 40th annual meeting there on February 7 and 8. The attendance was beyond expectation. There were 110 veterinarians registered and 30 wives who attended the sessions for the ladies. Practically everyone present attended the dinner-dance on the evening of the first day.

The papers and discussions manifested the trend of affairs in the profession in this State. They indicated that the profession is changing with the times. Much was said about tuberculosis eradication, diseases of dairy cattle, municipal meat inspection, public health work, poultry diseases and very little about subjects that were commonly discussed a few years ago.

The social event of the meeting, which was so popular a year ago, was repeated this year and was received with even more enthusiasm than last year. A banquet fit for a king, with music by a college orchestra and entertainment by the college yell-master who is a veritable comedian, followed by dancing, cards,

smokes and real heart-to-heart talks with old friends, occupied the whole evening.

The ladies enjoyed a theater party, the dinner-dance, a lecture on nutrition in the Home Economics Department of the college, a visit to the Girls' Practice House, an exhibition of swimming by co-eds in the gymnasium-pool, and a luncheon where men were entirely excluded.

Clinic consisted of a radical operation for fistulous withers, one for laryngo-hemiplegia, and a demonstration of a treatment for sterility in a cow.

The association went on record as endorsing the Sterling-Lehlbach bill for the reclassification of civil employees. It was voted to hold a summer meeting at the college in conjunction with the Veterinary Department of the College, the State Bureau of Animal Industry and the local branch of the Federal Bureau of Animal Industry.

The following officers were elected for the year: President, Dr. J. E. Wurm, Practitioner, Pigeon; 1st Vice-Pres., Dr. B. J. Killham, Chief Veterinarian, State Department of Agriculture, Lansing; 2d Vice-Pres., Dr. H. Preston Hoskins, Parke, Davis & Co., Detroit; 3d Vice-Pres., Dr. G. W. Cronkite, Practitioner, Saginaw; Secy.-Treas., Dr. R. A. Runnells, Department of Animal Pathology, Michigan Agricultural College; Director for six years, Dr. W. N. Armstrong, Practitioner, Concord.

R. A. RUNNELLS, *Secretary.*

OHIO STATE VETERINARY MEDICAL ASSOCIATION

The thirty-ninth annual meeting of the Ohio State Veterinary Medical Association was held in the Hotel Deshler, Columbus, February 2 and 3, 1922. It was very largely attended and in many respects proved to be as satisfactory as any previously held.

Ohio veterinarians were fortunate in having the opportunity of hearing probably more good speakers than we have had at any single meeting in the past. Every effort was directed to have the program so balanced that, regardless of what particular line of veterinary work one was primarily interested in, he would find something directly interesting him.

The subjects and speakers were: "The Bull as a Dissemina-

tor of Genital Infections," Dr. W. L. Williams; "Botulism," Dr. Robert Graham, University of Illinois; "Observations of Veterinary Practice," Dr. J. V. Lacroix, Editor, *North American Veterinarian*; "Brief Consideration of the Splanchnology of the Fowl," S. Sisson; "Importance of the Poultry Industry," O. V. Brumley; "The Modern Dairy Goat," William H. Gribble; "Cooperation and Policies," Bruce Edgington, State Veterinarian; "Use of the Stomach Tube in the Horse," C. C. Page; "Swine Diseases and Management of a Hog Ranch," Donald J. Frame; "Demonstration of the Examination of the Feces of the Dog for Parasitic Infestation," L. W. Goss and R. E. Rebrassier; "Sterility and Abortion from a Practitioner's Standpoint," R. R. Laughlin. In addition to the above-mentioned veterinary speakers, the Association was addressed by L. J. Taber, Director of Agriculture of Ohio; Wayne Dinsmore, Secretary of the Horse Association of America; Howard C. Barker, Secretary of the Holstein-Friesian Association of Ohio, and Col. D. L. Perry, auctioneer, known well and favorably over the Middle Central States.

The reports of the committees were usually good, in that they called the attention of the profession to existing conditions of all kinds. The Legislative Committee made a rather detailed report on existing conditions in Ohio with respect to illegal serum and virus sales to nonlicensed "swine specialists." The report was based upon over 100 replies to a questionnaire mailed out January 10. By action of the Association a special committee was appointed to collect information upon such illegal sales in Ohio during this year, and to notify the members at least quarterly of all facts learned, including the names of such firms as sell promiscuously to these laymen without a permit from the State.

In his "Good Night" remarks after the banquet, February 2, Dr. Harry T. Moss announced that those present had just enjoyed filet of Percheron with mushroom sauce, the same having been brought from Lima, Ohio, by Dr. J. H. Blattenburg.

The commercial exhibits were an important part of the meeting. Out of consideration to these firms we offer the suggestion that the secretaries of the various State associations holding meetings in January and February each year endeavor

now to select dates which will not conflict, thus enabling each firm to attend all meetings. The advertising of these same firms goes a long way in supporting many veterinary publications within our country.

F. A. LAMBERT, *Secretary.*

VETERINARY CONFERENCE AT KANSAS AGRICULTURAL COLLEGE

The first annual veterinary conference was held at the Kansas State Agricultural College during Farm and Home Week, February 7 to 10, inclusive. More than 250 graduate Kansas veterinarians were in attendance. A very full and comprehensive program on animal tuberculosis was carried out in every detail. Those who took an active part in the conference were Dean Dykstra, Doctors Bushwell, Leinhardt, Sisson, Kiernan, Salsbery, Campbell, Muldoon, Stingley, Kinsley, Umberger and Mr. Mercer. There were demonstrations and practical exercises in the application of the various tuberculin tests, together with the slaughtering of the reacting cattle and practice in meat inspection. The Farm and Home Week banquet was a fine diversion which was appreciated by all. The veterinarians attending this short course in animal tuberculosis were very much pleased with the material presented and the unanimous wish was expressed that Dean Dykstra would make it an annual affair.

KENTUCKY VETERINARY MEDICAL ASSOCIATION

The midwinter meeting of the Kentucky Medical Association was held at Owensboro, Kentucky, on February 8-9, 1922. We enjoyed one of the most successful two-day meetings ever held in the western part of the State.

On the first day Dr. C. W. Fisher, of Danville, presented a paper on Forage Poisoning; Dr. W. W. Dimock, of Lexington, gave an interesting talk on Johnes's Disease; while Dr. G. P. Isbell spoke on Locus Minoris Resistentia. These papers were discussed by Dr. T. P. Polk, Lexington, Dr. D. E. Westmoreland, Owensboro, and Dr. H. Gieskemeyer, Newport. Dr. W. W. Dimock also took active part in all discussions and some very valuable information, as usual, was gleaned.

Thanks to the untiring efforts of the entertainment committee a delightful banquet was served that evening at the Rudd House.

The second day was devoted entirely to the subject of tuberculosis. Dr. Elmer Lash, of Washington, D. C., read a most interesting paper on "The Campaign to Eradicate Bovine Tuberculosis," after which a general discussion followed. Dr. W. H. Simmons, State Veterinarian, read a paper on "Tuberculin Testing of Cattle by the Intradermic Method." In the discussions that followed Dr. W. F. Biles and Dr. E. B. Haskins took an active part. Some very valuable points were brought out regarding dosage, size of syringe, needle, etc. In the afternoon, post-mortems were held on reactors at the field packing plant. This was followed by examinations for accredited herd work, which brought to a close one of the most interesting meetings ever held by this Association.

The following resolution was unanimously adopted:

WHEREAS, The Bureau of Animal Industry of the United States Department of Agriculture is the largest unit in the world composed primarily of veterinarians, and that this class of scientific employes render an invaluable service to the nation in the protection of livestock against the ravages of contagious and infectious diseases, and

WHEREAS, the compensation offered by the United States Government for this class of professional services is not adequate or in comparison with the training and qualifications required for veterinary positions in the Bureau of Animal Industry, and

WHEREAS, the low salaries paid by the Government to its veterinarians engaged in the control of animal diseases in the field and in the application of the Meat Inspection Law of 1906, bring about the resignation of many of these trained inspectors each year, lowering the efficiency of public service of this class, therefore,

Be it Resolved, By the Kentucky State Veterinary Medical Association in session assembled, that we urge upon the Congress of the United States early and favorable action on pending legislation which has for its object the reclassifying of the Department of Agriculture, and

Be it Further Resolved, That copies of this resolution be forwarded to Senator Stanley and Senator Ernst.

The officers elected were as follows: J. K. Ditto, Pleasureville, president; William M. Coffee, LaCenter, first vice-president; J. A. Austin, Fulton, second vice-president; E. C. Higdon, Madisonville, third vice-president; J. A. Winkler, Newport, secretary-treasurer.

The midsummer meeting of this Association will be held in Lexington, on July 12 and 13, 1922.

J. A. WINKLER, *Secretary*.

VETERINARY CONFERENCE AT THE UNIVERSITY OF PENNSYLVANIA

On February 28 and March 1 a very interesting conference of veterinarians was held at the School of Veterinary Medicine of the University of Pennsylvania. There were about 175 veterinarians in attendance, largely from Pennsylvania, but many from New York, New Jersey, Delaware, Maryland, District of Columbia and Ohio. The program provided for the presentation of many phases of the problems connected with the swine and cattle industry by recognized authorities. The speakers covered their subjects in a masterly manner, and the great interest of the audience was manifested by the lively discussions which followed.

On the opening day, Dr. E. C. Schroeder, of the U. S. Bureau of Animal Industry, delivered a paper on "The Present Status of Vaccination Against Abortion Disease of Cattle." He emphasized the necessity for more knowledge of the nature of the abortion bacillus before the subject can be lifted out of the experimental state in which it now is. He also said that tremendous doses of living cultures were necessary in attempting immunization; that an animal so treated would possibly be a spreader; and that there is no reason to believe that dead suspensions of the organism have any immunizing value. Dr. Schroeder told of his study of twenty-four samples (representing five different firms) of anti-abortion vaccines obtained on the market. Of these 15 contained only bacteria identified as the Bang bacillus, 2 contained other bacteria and the Bang bacillus, and 7 contained many other bacteria and a spore.

His conclusions were that 44 per cent of these samples were

of doubtful value and 79 per cent were not only doubtful but worthless and dangerous.

Following this well-discussed paper, Dr. John P. Turner, of Washington, D. C., gave a very practical paper on "Experience in Practice with Udder Troubles." Dr. Turner covered the subject thoroughly, giving sound practical advice on the handling of every possible disease of the udder. He emphasized the importance of preventing mastitis, and advocated a large, clean, disinfected maternity stall for parturient animals; cutting off the hanging fetal membranes and eliminating sucking calves when the teats are sore. He questioned the presence of contagious mastitis in this country, most cases being sporadic.

In the afternoon session, Dr. W. L. Boyd, of the University of Minnesota, talked on "The Diagnosis of Pregnancy in Cows," and paved the way for the subject of sterility which he discussed the next day. He does not lay so much stress on the pulsation in the uterine arteries in diagnosing pregnancy as on the mucous plug in the cervix, the corpus luteum and the changes in the uterus. Ballottement is not possible before seven to seven and one-half months, according to Dr. Boyd, who also said that in heifers accidentally bred or if for other reasons it is desirable to terminate pregnancy, it may be accomplished at about the second month by expressing the corpus luteum, after which abortion will follow in about three days.

Acting Provost, Dr. J. H. Penniman, gave the attending veterinarians a very cordial welcome and spoke in a most appreciative manner of the work they are doing and the importance of it. He referred in very flattering terms to the Veterinary School of the University of Pennsylvania and to the fact that the University is proud of its scientific achievements.

A paper on "Hygiene and Sanitation in the Care of Young Animals" was presented by Dr. E. S. Deubler, of Penshurst Farms, Narberth, Pa. He spoke particularly of handling white scours, and told how he had kept his calves free from its ravages by building maternity stalls, with tight partitions, to the ceiling, and disinfecting the same after each calving with formaldehyde gas. He also urged the necessity of keeping heifers away from abortion infection for six months before breeding and until after parturition.

In the evening the conference was delightfully entertained

first by Dr. Edward Lodholz, Professor of Veterinary Physiology at the University of Pennsylvania, on the subject of "The Physiology of the Fetus." Following this entertaining lecture a smoker was given by the Alumni Society of the school.

The second day's program started with a lantern-slide talk by Dr. Boyd, on "The Pathology of Bovine Sterility." He explained thoroughly the slides which covered every conceivable pathological condition related to the subject. Later Dr. Boyd gave a practical demonstration of examining and treating sterility on five cases provided for the purpose. He handled the subject in a convincing manner, answering innumerable questions to the satisfaction of all. In discussing this subject, Dr. W. H. Ridge, Pennsylvania Bureau of Animal Industry, gave an interesting talk on prevention. He believes that the douching of all cows with a one and one-half per cent Lugol's solution from one week to ten days after calving is not injurious but beneficial, and submitted charts of the breeding records of three herds of several hundred animals which he had been treating in this manner for four years, and the proof seemed conclusive that sterility had been reduced to a minimum.

Dr. George W. Grim, of Plainsboro, N. J., read a paper on "Treatment of Retained Placenta in the Cow." His experience covered 107 cases. Many different methods were reported with the results attending. The conclusion seemed to be that the membranes should be removed as soon as they can be readily separated from the cotyledons. In a number of cases he took them away in twenty-four hours with satisfactory results.

The final session was opened by Dr. W. B. Niles, of the U. S. Bureau of Animal Industry, whose subject was "Hog Cholera and Other Infectious Diseases of Swine." Among the many important points brought out by Dr. Niles, the following were noted:

1. Hog cholera may be controlled, but it will be many years before its eradication.

2. Owing to the varied symptoms and lesions, the diagnosis of hog cholera is often difficult, but delay is dangerous, so use serum alone if not sure of diagnosis, and double treatment if no doubt exists.

3. The administration of the simultaneous treatment a short time after a single (serum) treatment does produce immunity, contrary to the belief of some.

4. "Breaks" are likely caused by insufficient virus or virus

of low potency. Best to handle "breaks" as any other outbreak.

5. Hogs, newly purchased in stock yards, should be given serum. After they are taken home and are over the fatigue of journey, etc., give double treatment.

Following Dr. Niles' interesting and instructive talk, Dr. H. H. Havner, of State College, Pennsylvania, spoke on "The Swine Industry in Pennsylvania." He explained how the State College Extension Department is developing the swine industry in Pennsylvania, and pointed out the difference in the status of this industry in Pennsylvania and Iowa, showing that improvement must be accomplished by community effort, because rarely does one farmer have enough sows to warrant the purchase of a high-class purebred boar.

Numerous feeding trials which have been conducted in various parts of the State were explained, and he showed that farmers who had marketed their corn through their hogs had received twice the market price for it.

It is regrettable that space does not permit the reporting of the valuable and instructive discussions which followed the papers. The conference was considered a great success by the many who attended.

V. G. KIMBALL, *Recorder*.

ARKANSAS VETERINARY ASSOCIATION

This is to advise that the Arkansas Veterinary Examining Board will meet at Old State House, Little Rock, Arkansas, Thursday, June 8, 1922, for the purpose of examining applicants for license to practice Veterinary Medicine.

The Arkansas Veterinary Association will meet at Little Rock on Friday, June 9, 1922.

A cordial invitation is extended to all veterinarians to attend.

JOE H. BUX, *Secretary*.

MISSOURI VALLEY VETERINARY ASSOCIATION

The winter meeting of the Missouri Valley Veterinary Association was held at the Hotel Baltimore, Kansas City, January 31 to February 2. The first two days were devoted to papers and discussions, and a number of especially valuable contributions were made. The last day was devoted to the clinic held at the Livestock Pavilion of the Kansas City Stockyards.

President P. L. Cady presided at all of the sessions and deserves much credit for the able manner in which the program, as well as various discussions and matters of business, was handled.

The program was opened by a paper entitled "Cooperation in Animal Disease Control Work" by W. T. Spencer of Omaha, Nebraska. This paper made such a favorable impression that it was voted to have copies prepared at once to be supplied to all members of the organization, as well as to the leading agricultural publications of the country. The keynote was a strong plea for a more liberal spirit of helpfulness between members of the veterinary profession and the agricultural interests. The author stated that much injury has been done to the profession by petty jealousies and by trouble makers who have taken much pains to create a feeling between veterinarians and agricultural organizations, whose interests, he pointed out, are common.

Dr. E. F. Stewart presented a very interesting paper on "Milk Goats," giving some information of value pertaining to the various breeds, their productivity and their fitness for a place in the yards of those who are not in a position to keep a cow. Dr. Stewart is a recognized authority on milk goats.

Dr. G. A. Johnson presented a splendid paper prepared by himself and Dr. E. A. Logan on "Immunity." They gave a complete discussion of the forms of immunity and the methods of producing it.

An excellent paper by Dr. S. R. Johnson of Lansing, Michigan, entitled "The Practicing Veterinarian and His Relation to the Public Health," was read by title.

Dr. C. P. Fitch of St. Paul, Minnesota, gave a well-written paper on "The Control of Bovine Infectious Abortion." He contends that the abortion bacillus is seldom transmitted through the genital tract, but that the digestive tract is the principal port of entry. He regards the serological test as an accurate method of diagnosing infection, but that it is not necessarily an indication that the animal has ever aborted or will abort. He believes that much remains to be learned in connection with the control of the disease, but that sanitation and isolation of affected animals are important considerations. This paper was followed by a lively discussion.

Dr. S. L. Stewart read an interesting paper on "Interstitial Mastitis," a condition of which he has been making special study

for some time. He pointed out the pronounced difference between interstitial and parenchymatous mastitis. His line of treatment consists usually in an application of cold packs to the region, followed by mild massage, after which a mammary support is applied. He regards bacterins as an important adjunct to this treatment.

Dr. R. C. Moore of St. Joseph, Missouri, read an unusually valuable paper upon "Orificial Surgery." He took up specifically the surgery of the eye, ear, tracheal openings, urethra, vulva, anus and teat ducts. This paper is one which will be worthy of careful perusal when it appears in the veterinary press.

Dr. L. A. Merillat gave an extemporaneous address on "The Prospects of Equine Practice," in which he detailed some of his personal experiences in tractor farming, which only add emphasis to the statements made by others who have either engaged in or studied this problem. He believes that we will see both in the city and in the country a pronounced reaction from the tendency toward motor transportation and cultivation of the land.

"Canine Distemper" was ably discussed by Dr. J. C. Flynn. He called attention to some of the common dental affections of dogs which may be satisfactorily alleviated by the veterinarian. Among these are irregular dentition, accumulation of tartar, and alveolar periostitis.

Dr. F. R. Beaudette of Manhattan, Kansas, gave one of the most valuable addresses of the meeting on "Diseases of Poultry." A tabulated list of diseases as indicated by various symptoms proved to be a valuable aid to a classification of these diseases. Copies of this chart will be supplied to members of the association at an early date.

Dr. E. A. Cahill in a paper entitled "Botulism as it Applies to Swine" detailed the results of extensive investigations in connection with the alleged danger of introducing botulism through serums and virus in vaccinating hogs. The results of hundreds of such tests were negative in every case. He considers botulism from this source to be a negligible factor and the use of botulinus antitoxin as a preventive of botulism from such cases to be entirely superfluous.

Dr. J. W. Connaway of Columbia, Missouri, presented a series of lantern slides dealing with infectious abortion in swine,

which he considers to be specific infection similar in many ways to abortion disease of cattle. His studies have been interesting and proved very instructive.

A most valuable contribution was presented by Dr. H. B. Raffensperger of the United States Bureau of Animal Industry on "Ascarids in Swine." His paper was supplemented by a two-reel motion picture giving the details of the life history of this worm and the control measures which have proved effective. He stated that the identity of *Ascaris suum* of swine and *Ascaris lumbricoides* of children has been proved. In some cases ascarid infestation in children may result from exposure to places where wormy hogs have contaminated the soil. The recent discoveries regarding the life cycle of the ascarid prove that the young larvæ migrate into the portal circulation and by this route reach the lungs, where they often cause an intense edema, accompanied by a characteristic thumpy respiration. Comparisons of hogs infested with ascarids and those kept free from birth showed a very pronounced advantage in favor of the ascarid-free pigs. Pigs can be kept free by putting the parturient sows into farrowing pens which have recently been thoroughly scrubbed with hot water and lye, the sow herself first being thoroughly cleaned and freed from dirt. The brood is later transferred to pasture in which infested hogs have not previously been run. The ascarid eggs germinate at comparatively low temperatures and in wallows, mud holes, etc., where some moisture is present, becoming infectious within a few weeks after they reach the outer world in the droppings of infested hogs. They are exceedingly resistant to the action of disinfectants and require such measures as hot water and lye to destroy them effectively.

Dr. M. Dorset was listed to present the subject "The Present Status of Hog Cholera Immunization," but on account of his inability to attend the meeting, Dr. W. B. Niles ably substituted for him. Dr. Niles considers that hog cholera is the one great scourge of the hog raiser and that it is usually a safe procedure to vaccinate without waiting for a positive diagnosis of the disease. He considers that the serum immunization is of considerably shorter duration than has been generally thought, but that the serum-alone treatment is indicated in those cases where there has been a "break" following regular vaccination.

During the clinical program a number of interesting oper-

ations and demonstrations were put on by Drs. Beaudette, Young, Kingman, Merillat and others.

The social program was well arranged, and visiting ladies were entertained by the local committee at card parties, theater parties, tours, etc. On Wednesday evening a vaudeville program and dance were tendered the visitors by the veterinarians of Kansas City and their wives, to whom much credit is due for their well-arranged plans and generous expenditures of time and money to make the meeting a success.

R. F. BOURNE, *Secretary*.

PRACTITIONERS' COURSE AT AMES

The annual meeting for practitioners given under the auspices of the Practitioners' Course Fund was held at Ames, Iowa, January 20, 1922. The meeting was given over to a consideration of the diseases of breeding animals.

One hundred and twenty-five veterinarians from the state and surrounding states were present and showed a great interest in the subject presented. This number represents about one-sixth or one-seventh of the total number of practicing veterinarians in Iowa and indicates the importance of this subject and the interest being taken in helping to solve the problems of the breeders of livestock.

The program for the day was as follows:

10 to 10:30 a. m.—Registration.

10:30 to 12:30—Lecture and demonstration on the normal genital tract of the cow at various stages of the estrus cycle.

1:30 to 5:30 p. m.—Lecture on the most common causes of sterility in cattle in Iowa followed by a demonstration of the technique of the surgical treatment of sterility.

In demonstrating the normal, freshly dissected specimens, three living animals, and one anatomical specimen of the entire animal suspended in the normal position in a fresh state with all organs in their normal relation to each other were used.

In demonstrating the abnormal, nine clinical cases provided by the clinic staff affected with various conditions, and a number of pathological specimens in a fresh state obtained through the courtesy of Dr. L. Enos Day of Chicago and Dr. C. W. Deming of Des Moines, were used.

During the latter part of the afternoon, each one present was given an opportunity to inspect for himself each specimen and each case in order that as much detailed information might be given as possible. The specimens presented illustrated a variety of congenital malformations and failures of proper development which result in sterility, cystic ovaries, persistent corpora lutea, endometritis, pyometra and retained placentae. Also a series of pregnant uteri showing the size and development in the various ages from one to eight months. The clinical cases illustrated cystic ovaries without nymphomania, cystic ovaries with nymphomania, pyometra, endometritis, cervicitis, and vaginitis in cows, and metritis and congenital lack of proper development of the genitalia in sows.

H. E. BEMIS, *Chairman.*

NEVADA VETERINARY ASSOCIATION

The Nevada State Veterinary Association held its fourth annual meeting in Reno on January 31, 1922.

The program consisted of an afternoon and evening session.

At the first session, Dr. George H. Hart, of the University of California, gave a review of the present status of knowledge regarding infectious bovine abortion and some of its allied problems. His address was followed by Mr. Chas. E. Fleming, of the Nevada State Experiment Station, on the "Commoner Poisonous Plants of the Meadows and Ranges of Nevada." Dr. L. R. Vawter then gave a review of "Abstracts from Current Medical and Veterinary Literature."

The evening session, held at the Reno Chamber of Commerce, was thrown open to dairymen and stockmen.

Dr. Hart spoke on "The Major Economic Factors Concerned in Dairy Development." Mr. Chas. Norcross, of the Agricultural Extension Division, offered some remarks on "The Financing of Farm Projects" and stressed the need of some system whereby the farmer might operate under long-term credit in the development of permanent farm improvement.

The annual election of officers resulted in the selection of Lyman R. Vawter as president, Walter H. Hilts, stationed at Elko, as vice-president, and Stephen Lockett as secretary-treasurer.

STEPHEN LOCKETT, *Secretary.*

COMMUNICATION

INTERPROFESSIONAL COOPERATION

TO THE EDITOR:

I am quoting you an extract which I believe should be of interest to readers of *THE JOURNAL*. It is from an editorial in the current (January) number of *The Journal of State Medicine*, which is the official journal of the Royal Institute of Public Health, London, of which I happen to be a member—Overseas.

It is as follows:

"In view of the increasing importance of a more accurate knowledge of diseases communicable from animals to man and the necessarily greater part veterinary surgeons must take in preventive medicine, and further, the now recognized connection of dentistry with child life, the Council has resolved to extend an invitation to veterinary surgeons and registered practitioners in dentistry to join the Institute, by which means they hope to extend its usefulness, and impress the public from a public health point of view of the importance of their respective professional duties."

This sounds good, and I feel that the information ought to be disseminated.

W. H. DALRYMPLE.

GIBSON GOES TO ST. JOSEPH

Dr. J. I. Gibson, formerly State Veterinarian of Iowa, and more recently a field agent of the Illinois Veterinary Medical Association, has been engaged by the St. Joseph Livestock Exchange, the Stock Yards Company and related interests to direct a campaign to eradicate animal tuberculosis in the territory tributary to the St. Joseph market. He has moved from Bloomington, Ill., and will immediately outline a program of operation for northwest Missouri, Kansas and Iowa. It is probable that Dr. Gibson will proceed along the line of similar work now being carried on under the direction of the Livestock Exchange at Kansas City, St. Louis, Omaha, Chicago and other markets.

NECROLOGY

Dr. Joseph D. Dunkel died on January 29 at his home, 25 Orchard Street, New Rochelle, New York. A severe cold terminated in pneumonia. His death came as a shock to his friends, and Dr. Dunkel had many of them.

Dr. Dunkel was born in the vicinity of New York City May 31, 1887, graduated from the New York American Veterinary College in the class of 1908, and entered the service of the United States Bureau of Animal Industry December 4, 1908. In April, 1912, he was selected to succeed Dr. J. J. Hayes, who resigned as assistant chief of the Bureau station at New York to head the Manhattan Sanitary Inspection Association, and on January 1, 1917, he left the Bureau to succeed Dr. Hayes again, who resigned his position with the Manhattan Sanitary Inspection Association.

Dr. Dunkel was a man of pleasing personality. This, together with the ability, energy and earnestness he always displayed in his work, attracted attention, and he was induced to accept a position with the United Dressed Beef Company of New York City on January 1, 1919, and was advanced rapidly to the position of assistant superintendent. Dr. Dunkel is survived by a widow and two children, who in their bereavement have the sincere sympathy of all who knew him.

Dr. Henry S. Lewis, of Chelsea, Massachusetts, died on January 4, 1922, of pneumonia. He was ill only a few days.

Dr. Lewis was a graduate of the Veterinary School of Harvard University in the class of 1889. He joined the American Veterinary Medical Association in 1899. He was a member of the first Veterinary Examining Board of the State of Massachusetts.

Resident Secretary W. H. Robinson reports the death of Dr. William L. West of Belfast, Maine, who was a member of the Maine Veterinary Association and the A. V. M. A. Dr. West died the latter part of December.

He also records the death of J. B. Darling of Belfast, Maine, who passed away January 10, 1922. He was a member of the Maine Veterinary Medical Association.

MISCELLANEOUS

IT'S PYORRHEA

By J. M. B.

Have you corn upon your toes?
It's pyorrhea.
Have you freckles on your nose?
It's pyorrhea.
When you hurry do you wheeze?
Are you shaky at the knees?
Are you getting hard to please?
It's pyorrhea.

Have you specks before your eyes?
It's pyorrhea.
Has your head increased in size?
It's pyorrhea.
Are you restless when at home?
Are you bald upon the dome?
Did you ever write a poem?
It's pyorrhea.

Is your liver out of whack?
It's pyorrhea.
Have you pimples on your back?
It's pyorrhea.
Are you itchy anywhere?
Have you dandruff in your hair?
Have you any cash to spare?
It's pyorrhea.

IT'S BOTULISM

(With Apologies to J. M. B.)

Do your cattle stagger round?
It's botulism.
Do they stamp and paw the ground?
It's botulism.
Have their eyes a glassy stare?
Is there roughness in their hair?
Is their skin rubbed smooth and bare?
It's botulism.

Have your hens the limberneck?

It's botulism.

Do they flounder on the deck?

It's botulism.

Gapes and pip lose all their terror,

Former names are all in error,

Chicken pox is growing rarer,

It's botulism.

Do your swine reject their swill?

It's botulism.

Have you funds to pay your bill?

It's botulism.

Forget scirrhoux cord and seabies,

Forage poisoning and rabies,

Even ills of little babies,

It's botulism.

THE NEW AUTOMOBILE EMBLEMS

In this issue of the JOURNAL is enclosed a folder. On the title page there is a reduced cut of the new automobile emblem. This emblem is a very handsome one, of crimson, white and gold. It is furnished with pins, ready to be attached to the radiator. The California veterinarians ordered seventy-five in one lot.

Many cities extend parking and other traffic courtesies to those having the emblem on their ears. Every member of the Association should have one of these beautiful emblems. The price is only \$1.25 postpaid. Send your order at once to Secretary Mayo.

In Detroit, where so many of the nation's automobiles are manufactured, the Animal Welfare Association reports 70,000 horses—a gain over 1917 of 10,000, and over 1911 of 30,000.

Dr. M. C. Essex is now at the Werntz Memorial Veterinary Hospital, and the JOURNAL wishes him success in his new field of endeavor.

Dr. O. E. Troy, of Raton, New Mexico, Resident Secretary of the A. V. M. A. for that State, was married on January 3, 1922, to Miss Alvina Postel of Albuquerque. They have just returned from a two months' honeymoon trip to the Hawaiian Islands and will be at home to their many friends in Raton, N. Mex.